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### An Address.<sup>1</sup>

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THE honour of delivering the annual address to the Association has this year fallen to me, and I deeply appreciate the privilege. As I understand the occasion, the lecturer has more latitude than he has in reading a paper on any given aspect of radiology and can give expression to some beliefs which he may hold, though he may be unable in some instances to bring forward proof more solid than his own accumulated experiences.

<sup>1</sup>Read at the annual meeting of the Australian and New Zealand Association of Radiology at Sydney on February 8, 1939.

It is now thirty-three years since I first worked an X ray apparatus, and during all these years, except during week-ends and holidays and during trips to Europe, barely a day has passed without my using my X ray machine. My experience in skiagraphy was limited to one year (1907) during which I was a senior resident medical officer in charge of the X ray department at the Royal Prince Alfred Hospital. It is perhaps interesting to recall the conditions under which the work was done in those days. The honorary officer at that time was a layman, who was interested only in the radiographic side. The apparatus was a six-inch coil with a dipper break. There was no milliamperemeter or kilovoltmeter. The tubes were, of course, gas tubes, air cooled, but without any radiator, and most of them without any mechanism for lowering the vacuum. The importance of distance was not stressed. One simply placed the tube in what appeared to be a convenient situation and gave what

one thought was a reasonable time of exposure. The tubes were always giving trouble; on the whole they gradually hardened, but sometimes with a prolonged exposure they would suddenly soften, perhaps to harden again on cooling, so that they would spark all along the glass wall and perhaps puncture on being put into commission again. At other times they might become cranky and refuse to function except when the vacuum was so low as to provide only the softest of X rays. This was largely due to the effect of inverse current, for the exclusion of which no provision was made. In my year some improvements were made. We got a MacKenzie-Davidson rotary break, and after a great argument with the board of directors two tubes with an automatic spark device for regulating the vacuum were purchased. If I remember rightly, the non-regulated tubes cost about £5 each and the new ones £7 10s. The fuss and argument that went on about the extra £2 10s. remains in my memory still. If one had suggested that the price of £250 or more should be paid for a tube, as in modern days, I am sure all the members of the board of directors would have died simultaneously in separate apoplectic fits. The power we used came from accumulators, which were constantly weakening and which had to be recharged. There was no assistant except for about two hours in the morning, when a nurse was provided to marshal the patients and to get them undressed for the exposure to be given. The nurse was changed after a varying period, generally two months. I had never developed a negative in my life before taking on the job of resident radiographer; but I was lucky in the nurse first allotted to the X ray department during my tenure in that she was an enthusiastic amateur photographer who taught me the rudiments of developing the plates. It may be surprising, but we had accelerating screens; owing to the cramped and unsuitable benches in the developing rooms, however, these were constantly getting splashed with developer *et cetera*, and were soon ruined.

Of course, most of the radiography was of fractures, but occasionally there was great excitement when one got a fairly clear representation of a renal or vesical stone after an exposure of five to eight minutes. I say "representation" advisedly, because almost as often as not, especially in the case of renal and ureteral cases, the stone could not be found on operation. Calcified glands, a fault in the plate or in development, or some other mischance had created an illusion. Needles in the hand or foot were great adventures. One horrible misadventure I remember well in this connexion.

The radiograph showed an unmistakable piece of a needle fairly deep in the muscles of the ball of a thumb. A few days later the patient was brought up and anaesthetised. The radiograph apparently showed a left hand. So in we went, full of confidence, but were entirely unable to find the needle. When the patient came out of the anaesthetic she complained bitterly that we had cut the wrong hand. The plate had been faced the wrong way in the holder when the exposure was made, but when looked at right side up it made a radiograph of a right hand provide the picture of a left hand.

Even in those days we used to treat by X rays some cases of carcinoma of the skin and keratosis. Many of them were those hopeless and hideous conditions which the modern student and younger practitioner never see today, namely, those which had mined great holes into the face, laying open the antrum, nasal cavity or orbit, and sometimes all three. Some of them, however, were earlier and more manageable, and, strange as it may seem as one looks back on the technique employed, we used to cure some of them. When I say "technique" I should more correctly say lack of technique. As far as I can remember, we never actually measured the focal skin distance; we just put the tube at what looked to be the usual position. The tube was held by a wooden clamp clasp the anodal stalk of the tube, which was bare. We did have sheets of tea-lead to cover the patient, and in these we cut a hole to expose the lesion. The patient was brought up two or three times a week and given a dose by time measured by one's own watch—not by an interval timer. The unrecorded milliamperage went up and the unrecorded kilovoltage went down as the tube softened with the heating of the anode, and *vice versa*. The tube used one day was often different from that used on the patient's next visit, and even if the same tube was used it was generally softer or harder than on the previous occasion. The distance of the tube was probably never the same, but the patients were all given the same time of exposure on each visit. On the whole, however, I suppose it averaged out fairly satisfactorily, as the variations in milliamperage and kilovoltage operated in opposite directions. Since the individual fractions delivered on each occasion were small, the variations in distance from day to day probably balanced one another in the long run. Whatever may be the true explanation, however, the fact remains that quite a number of patients with skin carcinoma were cured, at least to all appearances. About recurrences I cannot speak, as my tenure ended with a year's service. It is hard to remember exactly, but I think my first experience with Sabouraud pastilles was in England in 1908. I cannot recall ever seeing or using one during my term as resident radiographer at the Royal Prince Alfred Hospital. We certainly did not during my term of office even try any X ray epilation of scalps or beards.

Before leaving this sketch of the conditions under which I began my radiotherapeutic work, I want to stress several points:

1. That the honorary officer in charge of the X ray department was a layman who came up only occasionally when an honorary surgeon asked for him to take a radiograph in a particular case.

2. That every year a new resident medical officer took on the work with the benefit of only a week's understudying of his predecessor and with no real supervision by his honorary, who certainly never gave any instructions whatever in radiotherapy, in which he had not the slightest interest.



3. That in 1927 I was shown an apparatus in use in Harley Street which was practically identical with the six-inch coil equipped with a dipper break which I used in 1907. It was even pointed out with pride that this apparatus had a gadget to record the number of interruptions as a check on the dosage. It is no wonder that the results obtained with medium X ray treatment in England do not impress the operators, and that the latter find it difficult to accept the results we publish.

4. And finally, that the method used in the treatment of skin carcinoma in those days was a divided dose technique.

After this came rapid improvement. I can recall the pride I felt in my own first X ray apparatus—an eight-inch coil with a mercury jet interrupter, a milliamperemeter (still no kilovoltmeter), a tube-box with lead protection, an aperture in the base, and distance sticks to ensure approximately correct focal skin distance. The tubes I brought back all had attachments to provide some regulation of the vacuum. And I had Sabouraud pastilles to measure my dose. And this was only three years after I had left my resident job at the Royal Prince Alfred Hospital. The only means used for the estimation of the kilovoltage was by a point-to-point spark gap. Tubes were still a nuisance and generally very short-lived, but with measuring apparatus one soon found oneself giving bigger and bigger individual fractions in treating skin carcinoma, and within a few years the massive single dose technique to limited areas forced itself upon one by reason of the better and more regular results obtained. But, of course, our dose estimation was still much less accurate than we imagined at the time, and trouble came with overlapping techniques for epilation or for the treatment of large areas. The principles governing overlapping doses were quite wrongly interpreted in those days, as the angle of incidence was credited with exercising a very important influence on the amount of radiation absorbed by the skin; whereas we know now that until the angle of incidence (not the glancing angle) reaches  $80^\circ$  it has no influence at all upon the dose absorbed. Everybody was too much absorbed with calculating the intensity of the radiation delivered at a particular point or area, while neglecting the amount of radiation absorbed in a given horizontal layer. The ratio of radiation falling upon a surface to radiation absorbed in a given layer of X millimetres in thickness varies first with the average wave-length of the radiation, and secondly with the length of the path of the beam through the given layer. In other words, a smaller proportion of a short wave length beam is absorbed in a layer X millimetres deep than is absorbed when a beam of longer wave-length is used. Secondly, when in the edge of a large field a given beam passes obliquely through a layer of X millimetres of vertical depth, its path through that layer is longer than its path through the same layer where it passes through vertically in the centre of the beam.

The result of this longer oblique path of the beam at the edge of the field is that the beam meets more atoms and a larger proportion of the beam is therefore absorbed. And it is the amount of radiation absorbed and the atomic disturbance created by this absorption in a given layer of X millimetres depth that determine the magnitude of the effect in that layer produced by the radiation.

In addition to this and to the knowledge of the fact that a given dose of hard X rays, as signalized by the production of the B tint in a Sabouraud pastille, will produce less effect in tissue than the dose of softer radiation, which produces a B tint, we now know that the estimation of any two observers as to when a pastille has reached the colour of the check standard provided varies at least  $\pm 10\%$ . With all these errors in operation over so long a period, it is obvious that in the practice of everyone carrying out X ray therapy under such conditions quite an appreciable number of instances must have arisen in which overdosage must have occurred. That is why I find it difficult to preserve a benign or even a polite expression on my face when I read or hear of someone who professes to have done epilation hundreds or thousands of times by the old Adamson-Kienböck technique without a single mishap. I hate the expression, but nevertheless I feel inclined to say: "Oh yeah."

The influence of the practice of deep X radiation and of radium therapy was very beneficial to techniques implying the use of X rays in the medium range. First, radium therapy by plaques made it apparent that a massive dose which would do irreparable damage if delivered over a long surface could be given with safety and benefit to a small area. This is mainly because there remain at the edge of the treated region uninjured blood vessels and undamaged epithelium. The latter can cover easily the irradiated area and obtain a good blood supply to preserve its existence. It was the results obtained by massive doses by a radium plaque that excited the first claim to the greater selective action of the shorter wave-length  $\gamma$  rays. Up went the X ray doses to produce the same degree of reaction, and results as good as those obtained by radium plaques were obtained. More than this, the results were more permanent than those provided by the radium plaque. The reason for the better results was subsequently shown to be the better depth afforded by an X ray tube at 20 to 30 centimetres distance than that provided by a radium plaque in contact (except for a millimetre or so of filter) with the skin. This holds for quite moderate kilovoltage of 100 to 140 with only one millimetre of aluminium filter, as compared with a radium plaque filtered by a whole millimetre of lead. A radium plaque so filtered provides to the tenth layer one millimetre thick only one fifth of the dose delivered to the first layer of one millimetre thickness. With quite moderate kilovoltage, 120 to 140 (constant potential, pulsating), at 30 centimetres focal skin distance the dose received at the tenth layer of one millimetre thickness is 75% of that received at the

surface millimetre layer. If one uses 200 kilovolt X radiation with one millimetre copper filter from 50 centimetres focal skin distance, the tenth millimetre can easily be provided with a dose which is 90% of that absorbed by the surface millimetre. When a radium plaque is used unfiltered or lightly filtered, as is done so frequently even in the present day, the disparity between dose absorbed in the tenth millimetre and that absorbed in the surface millimetre is in the neighbourhood of 1:50. These figures which I have given are not a matter of opinion, but have been worked out experimentally and mathematically with the help of different physicists. They are facts which can be checked by any of you; but you will have to use photographic film, because ionization chambers are too large to permit the measurement to be made accurately in the case of thin layers. The method in which photographic films are used for this purpose has been published in *The British Journal of Radiology* in a series of papers written in conjunction with Dr. Brose.

It can now be stated confidently that a radium plaque, an instrument which determined improvement in X ray therapeutic technique, is the least efficient applicator for radiotherapy that remains in use.

It is accepted now as an axiom that the efficiency of a radiotherapeutic technique depends upon the even distribution of a sufficient dose throughout the whole volume of affected tissue. This is where a radium plaque fails badly. It is also the reason why the repeated attempts to increase the milli-ampere-minute output by permitting the passage, through a more permeable tube wall, of softer radiation, which would otherwise not reach the skin, must always fail as compared with harder radiation, at any rate in the treatment of carcinoma of the skin, every cell of which must receive a cancericidal dose if the patient is to be cured. We have had three waves exemplifying this ill-advised attempt. Some of you will remember the tube with a Lindeman glass window, which permitted the passage of a large quantity of the softer rays that would have been absorbed by the ordinary glass wall of the standard tube. Its day was short. Next came the Bucky *Grenastrahlen*, given off at low kilovoltage and allowed to pass through a permeable glass wall. Its day was also short. One scarcely hears of *Grenastrahlen* now. Yet in the quality of the radiation provided there was little difference from that of the latest vogue of Chaoul therapy, which is only soft (long wave-length) low voltage X ray treatment. Chaoul contact therapy has an additional disadvantage as compared with its predecessors, in that the focal skin distance is much shorter. As shown above, the longer the focal skin distance, the better is the depth dose; and it is axiomatic that a technique providing a better depth dose is much to be preferred to a technique providing an inferior depth dose, at any rate in the treatment of carcinoma. Yet this very characteristic of poor depth dose is actually flaunted

as an advantage by the Chaoul advertisements. It is stated that the underlying tissues are not damaged. But what shall it profit a man if the underlying tissues are unaffected by the radiation if the deeper lying cells of his cancer are not killed? No! this is truly whoring after false gods. I have no hesitation whatever in saying that this is a fundamental defect of the Chaoul rays, and that it will cause the early decline of their use and determine the same fate as that which befel the Lindeman window and *Grenastrahlen*. There is, however, one notable advantage possessed by the Chaoul tube, namely, that it can be used in cavities. Therefore, it can be used to treat cancer inside the mouth, in the vulvo-vaginal region and in the anal canal. It should be useful in the treatment of leucoplakia and superficial growths in these regions, and frequently repeated applications may make it possible to provide a local cure of some few growths which by their anatomical position might not lend themselves to radium implantation. But I cannot see that, except under such conditions, it can compete with radium implantation in the treatment of carcinoma in these regions.

Another grave disadvantage of the Chaoul contact therapy is that the accepted technique is by repeated daily applications amounting to ten, twenty, thirty or even more individual exposures. These, by slowly wearing down the surface, so to speak, constantly bring deeper and deeper millimetre layers to the cancericidal dose level, as provided by the Chaoul tube. But it is safe to say that if a single massive dose is given with this apparatus, the result will be no better and probably worse than those given by an unfiltered radium plaque. They will certainly be much inferior to those obtained by an X ray tube working at 100 to 140 kilovolts at a distance of 20 to 30 centimetres.

Why the Germans, being short of radium, should set out to imitate the least efficient of the radium applicators (the plaque) is difficult to explain; but I should like to feel as confident that their recent political and social machinations carried as little danger to our established standards of national liberty and institutions as that which their recent radiation devices carry to our established and accepted techniques in radiotherapy.

The cost to the patient who has his skin carcinoma treated with Chaoul rays must be many times greater than that incurred by the patient who has a similar growth cured with a single application of ordinary medium quality X rays. In any case, the majority of patients whom I treat come down from the country and want to return in a few days and often the following evening.

Claims that keratoses can be "cured" by Chaoul rays in a dose insufficient to cause any noticeable scarring leave me quite cold. The same thing can be done and has been done times without number with ordinary medium X rays and radium plaques. But the point is that a notable proportion, if not a big majority, of such "cures" are only temporary, and that recurrences are the rule after six to



twenty-four months. If this occurs with medium wave-length X rays, so much the more will it occur with long wave-length Chaoul rays, with their inferior depth dose.

Once more I want to call attention to the danger of our speaking about keratoses without the use of qualifying terms. If you cut dozens or hundreds of keratoses, as I did years ago in search of the earliest discoverable carcinomata of the skin, you will be surprised to find how many actual carcinomata lie disguised under the keratotic mask. Almost every week I have a patient referred to me for treatment of a keratosis which has an infiltrated base. It can be laid down without fear of valid objection that every one of these infiltrated keratoses is really an early carcinoma, and that they all require the same dose as more obvious growths of the same kind. The small area of insignificant atrophic scar determined by an efficient and safe dose of radiation is a very small price to pay for the cure of a deadly disease. This is a subject upon which I can claim to have had an enormous experience, greater, I think, than anyone in Australia, and certainly greater than anyone in England; and I want to warn all and sundry that a system that prefers the absence of even a minor atrophic scar over a small area to an efficient depth dose is one which is going to sacrifice the patient's interests to a temporary cosmetic advantage of trifling value. I certainly would not permit such a method to be used in treatment of a keratosis on my own skin. I should here like to ask permission of my colleagues to draw upon my accumulated experience rather than to attempt to provide proof of this doctrine that very soft radiation from a short distance is dangerously inferior to the use of a sufficiently penetrating radiation in the treatment of carcinoma of the skin and lip.

I have no doubt that the proof will ultimately be forthcoming when the shortcomings of this form of radiation are made obvious by recurrences; but more time must pass before this proof is available.

It is not as if we had jumped suddenly from 80 kilovolts unfiltered to 200 kilovolts highly filtered radiation in the treatment of skin and lip carcinoma. This was a gradual transformation, the voltage and the filtration being gradually increased. In my own case I went on up to 140 kilovolts and three or four millimetres of aluminium, but found that I was gaining no further advantage, and have now come back to 110 kilovolts (constant potential), which is equal to about 130 kilovolts pulsating, and one millimetre of aluminium filter from 20 to 30 centimetres distance, as the most generally useful form of radiation in treatment of skin and lip cancer, unless of very advanced stage penetrating to a depth greater than one centimetre. In the latter case I use 200 kilovolts radiation, one millimetre of copper filter and 50 centimetres focal skin distance, or possibly radium implantation.

I feel sure that those who are skilled in the use of highly filtered radium at a distance calculated to get an even dose absorption through the desired depth

of involved tissue can obtain almost exactly comparable results. But I am equally sure that they will not get such good results if they do not carefully plan their technique in order to obtain an even distribution of an effective dose. And I am convinced by innumerable examples and by experiment that a radium plaque, even highly filtered with one millimetre of lead, but in contact with the surface, as against 20 to 30 centimetres distance in the case of my X ray tube working at 110 to 140 kilovolts with one to three millimetres of aluminium filter, cannot approach my X ray tube for efficiency. I sometimes fear that people think I am drawing the long bow when I state that, provided a carcinoma of the skin or lip has not penetrated deeper than one centimetre and has not involved bone, I do not care whether it is basal- or squamous-celled, I am prepared to forecast that not more than once in fifty times will I have to deliver more than one treatment to provide a cure, at any rate of the local growth. I feel that I ought to be able to claim 100% of successes, but little faults creep in now and then: for example, the inclusion of too narrow a margin of apparently healthy tissue outside the obvious growth, a deeper actual penetration of the growth than I had estimated, movement of the patient so as to bring the tumour out of the field of irradiation for part of the exposure, and so on. But I can assure the audience that there is not an appreciable fraction of exaggeration in the statement. It has been said: "Oh yes, we know you are a wizard with an X ray tube, but we prefer our radium plaque, it is so much easier." This is very flattering, of course, but there is no wizardry in it at all. It is only careful calculation of the dose of a given quality of radiation and the even distribution of that dose throughout the whole tumour that count for success. Of course in most instances one cannot achieve absolutely even distribution of dose, but no part of a tumour should receive 25% less than the part that receives the greatest dose. In other words, the position which receives the maximum dose should not receive more than 25% above the cancericidal dose, which must be the minimum received at any part of the growth. As an example of this, in the case of cancer of the lip the cross-fire method first by eversion of the lip and treatment of the inner surface, and then when the lip has been allowed to fall into normal position by treatment of the outer surface of the lip with the same dose, provides almost an exactly even distribution of dose and one has only to worry about the size of the total dose absorbed from both exposures. Several men who have followed this technique have come to me amazed at their success, which is practically the same as my own.

All this is by way of explanation why people, who are not aware of the excellence of the results obtained by reasonably accurate and carefully planned techniques with X rays of moderate quality in skin and lip cancer, fly off into ecstasies of delight when they obtain results with Chaoul or similar techniques which, to the man who operates

a standard technique, would seem commonplace or discouraging, and which would certainly not persuade him to desert his own technique in favour of the other.

It will be seen from this, and I wish forcibly to affirm it, that I have no preference for any particular wave-length of X rays or  $\gamma$  rays, unless one wave-length can be used to achieve a more even distribution of dose absorbed more easily than another wave-length. Short wave-length and longer distance operate to produce better depth dose. Up to a certain point a longer focal skin distance can be used to minimize the disadvantage of a softer radiation. By manipulation of these two factors the same result can be achieved with radiations of very different quality. With regard to actual dose, it is the degree of reaction in the tissue that provides a measure of dose absorbed, whatever the number of  $r$  units recorded by our various ionometers as a measure of incident radiation.

Before leaving this aspect of the question I should like to make an earnest appeal to all of you who practice radiotherapy to concentrate on the measure of dose absorbed and on the evenness of the distribution of that dose absorbed, rather than upon the chimerical greater selective action of any particular wave-length upon tumour cells. Examine your technique, test it with a model, vary it by changing your quality of radiation, your focal skin distance, your number of ports of entry, until you achieve a reasonably even distribution as recorded by a dependable measuring device, and then bring it into actual practice in the treatment of real patients. If you do so, you will be amazed at the improvement in your results. But first you will probably be disgusted with the unevenness of the distribution of a technique which you have followed with some smug satisfaction perhaps for years.

In this connexion too I just wish to mention something about manipulability of tubes. The large, cumbersome and comparatively immobile deep X ray tube often prevents the effective use of a technique demanding cross-fire in superficial tumours, though the latter is quite easy of achievement with the smaller and much more mobile tube for current up to 120 kilovolts. It is almost impossible to treat a lip efficiently with a 200 kilovolt tube, but it is easy to treat it with a tube for 120 kilovolts current. Many areas, under the brow, near the eye, especially on the lids, on the *ala nasi et cetera*, are difficult or dangerous to treat with a deep X ray tube, but easy, safe and economical to treat with the smaller tube. It is much more difficult to limit the field of irradiation with a 200 kilovolt radiation than it is with a tube for 120 kilovolt current. All these points have to be given their full value consistent with the major principles of magnitude and even distribution of dose when you determine the technique you choose.

Having recited my *credo* on the subject of wave-length with little fear of serious opposition today, though ten years ago it would almost certainly

have provoked a storm of protest, I now venture upon the much more debatable question of the value of spacing the dose: the time distribution of dose. As I have already reminded you, the early technique in X ray therapy was by divided dose. Then came the radium plaque, which showed the advantage of massive single doses over a small area. This lead was followed by men using X rays, and it soon became apparent that an X ray tube could provide even better results than a radium plaque, and better results than those previously obtained with X rays by divided dose technique. Next came the impetus of the technique of the use of radium highly filtered and implanted round the tumour. To get the necessary tissue reaction the needles had to be left in for a week to ten days. About the same time came the 200 kilovolt X ray technique, with its heavy filtration and cross-firing beams, large ports of entry and large surviving depth doses. The implantation of radium needles planned to produce an even effect of a very intensive dose inside the ring formed by the needles produced excellent results, especially in the tongue and lip, results which were notably better or even impossible of achievement by earlier radium and X ray techniques. The cross-fire between radium tubes arranged in the uterine cavity and in the fornices provided results which startled the surgeon and which were better, though not so much better as some would have us believe, than those that could be obtained with a properly planned deep X ray technique. Here is where I think some faulty reasoning came in. In both these radium techniques a very intense dosage was reasonably evenly distributed over a comparatively restricted volume of tissue in the region of cross-fire, but the radiation effect fell away very rapidly outside the ring of needles or tubes, so that nearby vital organs were not too seriously affected by the radiation. It would be quite possible, for example, to achieve the same dose as measured in  $r$  units in the *cervix uteri* by the use of deep X rays from four to six ports of entry without the production of damage in the skin and with a notably greater evenness of distribution of the dose. But unfortunately this evenness of distribution went far beyond the confines of the uterus and its adnexa. It would inevitably involve the bladder, small intestine and rectum in the same dose as that delivered to the cervix, though the former organs were spared an equivalent dosage by the radium technique if well planned. If such a dose as that required to kill with certainty all cells in a uterine cervical cancer were allowed to affect the other contents of the pelvis, the patient would die or suffer very dangerous consequences. Hence the radium technique won.

But here I wish to state my personal impressions. I think that the real reason was as I have stated it. However, the hypothesis was framed that this better result was due to the greater value of the spreading of the dose over the five to eight days during which the radium had to be left in position to achieve the necessary reaction. But latterly the radium men



have found that they must provide notably heavier lead protection between their sources of radiation on the one hand and the rectum and bladder on the other, if they are to get the best results without serious risk of later necrosis and fistulae in the walls of these organs. And I think it must be admitted that the deep X ray technique alone, as treatment for uterine carcinoma, no matter how long extended in time, cannot equal the radium results in a technique spread out only over five to eight days. Therefore, while not denying on this argument a beneficial effect in spreading the dose over a period of time, I do feel that the importance of this factor has been greatly exaggerated, even if it really exists. The highly hypothetical explanations put forward by Dr. Love, much though I respect his knowledge and thoroughness, are, I think, adequately countered by the practical experimental evidence which I propose to put forward.

While this controversy was in progress the use of multiple cross-firing beams of short wave-length X rays through large ports of entry in massive doses, especially when the abdominal region was treated, produced so much X ray sickness that operators were forced to diminish the individual exposures and to multiply them, thus spreading the dose over a longer time. In order to compensate for fading effect, a bigger total dose had to be delivered to produce the same tissue reaction in the long run. In some instances, for example, the glancing cross-fire of hard X rays through a breast, the X ray sickness was not nearly so general and so distressing a result as when the abdomen, and especially the upper part of the abdomen, was irradiated. But the same alteration in technique was followed and massive doses were superseded by fractional dose methods.

I want to revert once more to my previous account of the gradual evolution of the use of harder and harder X rays in the treatment of skin cancer and then to the reversion to a rather less penetrating radiation. This gradual change made it fairly certain that no grave error in the selection of quality of radiation was likely to have occurred. But the same does not hold with the development of techniques designated massive or fractional. In the former case there was the slow controlled swing similar to that of the dead-beat electrical meter, with no violent oscillations of the needle before it settled to the true reading. In the latter case there was the abrupt change from the fractional to the massive dose method, and then another, though not so abrupt, reversion to the fractional dose method. At the present moment I suggest that a good many of us are inclined to think that the massive dose method has at least many points of advantage. For years I have discussed these points with Moran and Love in Sydney, with Eddy, Cuscaden and Kaye-Scott in Melbourne. The arguments on both sides were too powerful to be rebutted entirely, and a friendly agreement to differ in details was formed. Let us come down to examples. I acknowledge that Kaye-Scott gets splendid results in carcinoma of the

lip with protracted radium treatment. Kaye-Scott also acknowledges that my technique with massive X ray cross-fire delivered in less than three-quarters of an hour gives approximately similar results. We both know that the minimum degree of tissue reaction which must be achieved by both techniques, if a cure is to be provided, is, as nearly as we can judge, equivalent. So we ask one another, and sometimes for fun we unite in asking Love, the protagonist of divided dose methods, what explanation can there be for the equivalence of our results when the time factor is so widely different in our respective techniques.

But I can go a little further than this. In some cases divided dose methods have had to be used for various considerations, generally in public hospitals. And in cases in which the degree of reaction has shown me that the dose I ordered has not been delivered, supplementary doses have had to be given. I find that the results in these cases are not better, but I think worse than when the correct dose has been given in the one sitting. In any case, the results obtained in my own practice with the massive dose method in carcinoma of the skin and lip are so nearly as good as I could reasonably hope for that I cannot bring myself to desert this method for one which will take much more time, cost the patient much more in fees, and from which I can scarcely expect improved results. I realize that it is dangerous to use for purposes of comparison the results achieved in hospital when the dose ordered by me has to be administered by a technician who probably thinks that my dosage (though limited to a small area) is heroic, and that he is the person who will get the blame if damage results. Hence he is liable to skimp my order. Again, there are perhaps eight patients to treat and two hours to go. They probably each get a shorter time, so that he can finish at the usual hour. I know that this occurs, because the reactions are so much nearer the required grade after I have gone on the warpath by pointing out that my dose cannot possibly have been delivered, as shown by the mild degree of reaction when the patient reports to me two to three weeks later. Things improve for a while, but tend to slip back again until once more I voice an effective protest.

But I have a little more evidence. In the deep X ray treatment of carcinoma of the breast we have gone over to the fractional dose method. In these cases I feel we do not get as good results as we got when we used massive dose technique. Occasionally to spare a very feeble patient the fatigue of repeated journeys to my rooms for fractional doses, I have been constrained to give the treatment in two sittings, one to deliver a full dose to the axilla and outer part of the breast, and the other, after two days' interval, to deliver a full dose to the mesial surface of the breast, the two beams being directed tangentially to the thoracic wall. My attention was drawn to the fact that the results achieved by this method appeared notably better than when the divided dose technique was used. On

further observation I have convinced myself that such is the case.

There the matter lies at present. The truth probably lies between the two extremes; but at present I feel convinced that it lies much nearer to the massive dose end than to the other.

Of one thing I am completely convinced, and that is that unless a tissue reaction equivalent to a marked erythema with some oedema is produced, it does not matter how large is the total of  $r$  units which have been poured into a carcinoma over a period of two to four weeks, the benefit achieved is small and transitory as compared with the results of a treatment (whether by massive or divided dose method) which produces such a reaction. I am sure that in treating carcinoma of the skin, lip, tongue or uterus, one has to go up to the very limit of tolerance of the healthy tissue to have a chance of permanent cure. The fading effect operates in favour of the carcinoma cell as well as in favour of the normal tissue, though apparently not quite to the same degree. And the margin between the successful dose and the dose that fails is too narrow to make it permissible to skimp the reaction in normal tissue if one is out to cure the growth. Underdosage is the cause of very many more deaths among patients suffering from cancer than is overdosage. As I am always preaching, "do not tinker when you are treating cancer, whether by surgical or radiological means". Count your failures by the deaths of the patients from cancer, and not by the number of patients who survive with a visible degree of post-radiation effect. It is not necessary to give such big doses as to cause radionecrosis, early or late, but some atrophic changes and telangiectases are trifles if the patient remains alive and well.

Owing to the impossibility of giving a sufficient dose to cure the carcinoma without doing fatal or irreparable damage to other organs, such as liver, pancreas, suprarenals, intestines and lung, I have given up using deep X rays for carcinoma of the gastro-intestinal tract and for secondary carcinomatous deposits in the lung. There are two major exceptions to this, however, namely, secondary deposits of seminoma in abdominal glands, and lymphosarcoma in the thorax or any other situation. These yield to such small doses that the above-mentioned organs tolerate them easily. These growths are gifts from the gods to deep X ray operators, and can be cured permanently and regularly by appropriate techniques. I often wonder how many patients are allowed to die because the surgeon and the general practitioner do not know how wonderfully they respond to moderate doses of radiation. I could go on for a long time talking to you of the things that make one wonder why the general practitioners do not send along their patients with *fibromyomata uteri* and premenopausal metrorrhagia for the very comfortable and regularly successful treatment by radiation. Why do not surgeons send along their patients with inoperable carcinoma of the breast for treatment

by deep X rays? Even if we admit, for the sake of argument, that they all die in the long run, is that a reason for denying them a year or two extra of life and a comparatively easy instead of a foul and stinking death? Why do physicians so rarely send patients with lymphadenoma and leucæmia for treatment by deep X rays? Even if they all die of their disease in the long run, nearly all of them gain a few years of useful and comfortable life as a result of deep X ray treatment. Why is this benefit denied the patient when no other treatment can approach X radiation in the matter of benefit provided? Are all patients with chronic nephritis, diabetes, arteriosclerosis, and all the rest of those suffering from incurable diseases to be sent off with instructions to die as soon and as painfully as they can because they must succumb to their malady in the long run?

In parenthesis let me tell you that the sufferer from chronic sciatica without demonstrable cause very often gets complete relief by repeated small fractions of deep X rays over the course of the nerve, and is most appreciative. Dr. A. J. Collins will give you particulars of the results.

Finally I should like to ask the physicists to go more closely into the problem of the recording of doses of radiation of different quality in terms of the standard ionization chamber. The wall effect of all our clinical ionization chambers is so important and confusing that we are still groping. American and other radiologists inform me that doses of 1,500  $r$  of 120 kilovolt radiation, beyond which I cannot go without causing necrosis, are a mere trifle as compared with what they find necessary to cure a skin or lip carcinoma. They claim to deliver 5,000, 7,000 and even 10,000  $r$  to provide a cure. Such a dose by my standards would cause a lip to slough through its whole thickness; but they report no ill effects beyond the cicatrix which replaces the tumour. This can only mean that the above-mentioned doses recorded by their instruments do not mean more than the 1,500  $r$  recorded by mine. The latter has been checked roughly against the standard chamber by means of an intermediate portable instrument, a sub-standard which has been checked against the standard chamber.

But in addition to help from the physicists we also need to bring our own expressions nearer to exactitude. A "pastille dose" means the maximum tolerated dose with one quality of radiation (70 kilovolts unfiltered), but only one-third of the maximum tolerated dose with 200 kilovolts radiation filtered through three millimetres of copper. An "erythema" dose is even less exact. Miescher has pointed out that, within the permissible range, doses varying as much as 7:1 are capable of producing erythema. So the description of a dose as an "erythema" dose is vague in the extreme. It is true that with a lot of experience one gets fairly good at estimating whether a degree of redness with a certain degree of oedema of the area is sufficient for our purpose. But this is far from



satisfactory, especially with the variation of readings in  $r$  units provided by various clinical ionometers.

Personally I speak of the "maximum tolerated dose". By this I mean the greatest dose that can be delivered to the skin without permanent damage to the skin and its appendages. This dose is a little less than half the minimum dose required to cure a carcinoma of the skin or lip (600  $r$  as against 1,250 to 1,500  $r$ ). But we require a unit dose below that which will cause permanent damage, such as atrophy of the epithelium and permanent loss of hair.

Therefore, I want to suggest that the standard should be the smallest dose which, delivered in one sitting, will cause complete epilation of a given area of the human scalp. As it happens, we have an approximation to this as a result of an accident recorded by Epstein in a paper which he wrote in support of my argument that the angle of incidence had no effect upon the dose of X rays absorbed in the skin. He had been accustomed for a long time to give a certain dose, "x", of a given quality of X rays by an overlapping technique to provide epilation of the scalp. This technique, like all others, does not permit the actual overlap to extend to the centres of irradiation, but only to a greater or less extent of the space intervening between centres. But the dose delivered to each centre was sufficient to determine complete epilation at that centre. By a mistake an assistant started the exposure at twenty instead of the usual thirty centimetres focal skin distance. When one field had been irradiated for the usual time the mistake was discovered, and no other fields were treated. It is easy to calculate that more than double the dose usually employed had been delivered to the area in question. Epstein waited in fear and trembling. The hair fell out with moderate erythema. But this passed off and the regrowth of hair was perfect. He related this because my calculations showed that some areas intervening between centres of irradiation (Adamson-Kienböck technique) must receive by overlapping approximately twice as much as the actual centre of each field. Yet with this technique the regrowth is normal in the great majority of cases, though the margin of safety must be very narrow. However, the point that I want to stress now is that here we have a very useful relation. The minimum dose of radiation required to produce complete epilation is slightly less than half the maximum tolerated dose, and the maximum tolerated dose is slightly less than half of the dose required to destroy carcinoma cells. Therefore, if one finds out what reading on a particular clinical ionometer (when one is using a particular quality of radiation) represents the minimum dose which will determine complete epilation of an area of five centimetres diameter for example, one can check this ionometer against the instrument used by a colleague. One can say that it is safe to deliver twice the minimum epilation dose to the same area

of skin without fear of doing any permanent damage. And one can say that to cure a carcinoma of the skin or lip one must deliver a minimum of five times the epilation dose to that portion of the tumour which receives the smallest amount of radiation.

I have always maintained, and I shall continue to maintain (at least until proof to the contrary is provided), that the final court of appeal upon the subject of the dose of radiation absorbed in tissue is the degree of reaction provoked in that tissue. Here, it seems to me, we have a standard ionometer in the human skin, a standard which is accessible to all of us, and one by which we can each check our own measuring instruments and arrive at comparable notations of dose.

This, I hope, you will find a helpful and constructive suggestion. And on this note I wish to conclude my address. I hope I have been able to provide you with a constructive review of the situation of radiotherapy as it stands today. We certainly have far to go before we can claim to have placed it upon an exact physical foundation, but I hope I have been able to suggest at least one of the paths by which a greater degree of exactitude can be achieved and by which more regularly beneficial results can be achieved.

I thank you for the patience with which you have heard me.

#### ACUTE GLAUCOMA: ITS NATURE, DIAGNOSIS AND IMMEDIATE TREATMENT.

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ACUTE "congestive" glaucoma, as it was once so aptly called, remains one of the most distressing ocular conditions. Its treatment continues to be largely unsatisfactory in spite of an immense amount of recent research into the nature and physiological economy of the internal structures of the eye.

Primary acute glaucoma, if only as a clinical boggy, has been familiar to all of us since our student days, when it was drilled into us that to confuse acute glaucoma with acute iritis was as bad as to confuse hæmorrhage from the middle meningeal artery with simple concussion. Too many of us, however, never encountered enough actual parallel cases to enable us to be certain of the diagnosis when we were first confronted with the condition in practice. Much valuable time continues to be lost by this unnecessary uncertainty in diagnosis, for treatment must be prompt and energetic, and every hour of increased tension causes irreparable damage to more and more retinal cells and optic nerve fibres.

The sudden onset, the severe radiating fifth nerve neuralgia, the dilated fixed pupil, the congested stony-hard eye, the rapid blindness, the nausea and loss of sleep make a clinical picture which, once seen, is never again mistaken.

#### The Nature of Acute Glaucoma.

The essential feature of the disease is a persistent rise in intraocular tension. The flow of aqueous fluid is obstructed within the eye, or where it filters from the eye at the angle of the anterior chamber into the external venous channels. This obstruction of aqueous flow leads to a gradual strangulation of the venous circulation within the eye, with mounting capillary pressure and engorgement. The obstruction to the aqueous fluid appears to be associated with the narrowing of the circumferential space and with the reduction in depth of the anterior chamber, due to intumescence of the lens, which occurs in early cataract changes. Thus acute glaucoma is commoner in the small long-sighted eye than in the large short-sighted eye, and it occurs mainly after middle life, when senile changes first make their appearance. When all the anatomical and senile conditions are favourable, it takes only some abnormal congestion of the vascular tissues of the eye to complete the blockage.

#### Predisposing Causes.

The history of the onset often reveals an unusual recent state of bodily congestion—constipation, alcoholic excess, over-eating, menstrual disorders, loss of sleep, or prolonged emotional states, such as grief or worry. Ill-ventilated, over-heated rooms, common at the end of winter or in early spring, or during the bad atmospheric conditions of heat waves in the summer, are a predisposing cause in elderly people. Indeed, some of these factors are often combined and the acute glaucoma comes as a penalty for irregular bodily or mental hygiene.

#### Prodromal Symptoms.

Sometimes a history of prodromal symptoms can be secured. The patient sees things as misty, and points of light become starry, with prismatic colours, called "rainbows", at the edges. Objects appear to have haloes around them. Not only is there a general mistiness, but it is found that the reading glasses, hitherto so satisfactory, become less helpful and the print has to be held further away to be seen. These symptoms are due to commencing oedema of the cornea and to paresis of the ciliary nerves.

#### The Attack.

The attack commences with pain in the eye and over the whole of the side of the face. The pain is neuralgic in character and radiates along the branches of the trigeminal nerve. There may be reflex nausea and vomiting. The eye is congested and painful to touch or even to move in its orbit. The sight rapidly diminishes. Sleep is impossible and the patient's mind is filled with anxiety and despondence.

There is a considerable variation in the acuteness of isolated cases and in different groups of cases, such as are encountered particularly in hospital practice. Often a succession of cases are encountered which seem to have a similarity of acuteness common to all and make one think that some seasonal or other aetiological factor is involved. Cases of severe type may be met with, some almost fulminating. In these both eyes may be involved early, and the lesion may be resistant to medical treatment. Again, the lesion may be much milder, in some cases being easily controlled by miotics; a few patients may escape altogether even a delayed operation to give vicarious drainage to the excess aqueous fluid.

The more severely ill patients are likely to have vomiting as a symptom from reflex irritability. The fixed semi-dilated pupil in these cases is often pear-shaped, the neck of the pear being above, at about the twelve o'clock position; sometimes this top portion of iris appears completely retracted.

#### Diagnosis.

Though rather a rare condition in general practice, acute glaucoma should always be borne in mind as a possibility in the presence of unexplained bilious vomiting, pain in the side of the face, or a painful congested eye in a patient above middle life. Cases have been known in which a glaucomatous eye has escaped treatment while the patient has been treated for gastritis or for a bilious attack, or even for migraine.

Frequently the facial neuralgia is attributed by the patient to a "cold" or to a sore tooth, and home remedies are tried. Often it is the pain and the loss of sleep that make the patient seek advice rather than the loss of sight, which is often overlooked until it is quite profound.

The only local condition which causes confusion with acute glaucoma is acute iritis, and disastrous results follow treatment with atropine, the worst possible thing to order for glaucoma. In the great majority of cases there is no need for confusion, and the signs and symptoms are unmistakable. There are occasions, however, when the differential diagnosis is really not straightforward, and iritis may be diagnosed incorrectly for glaucoma. In iritis the pain is present in the eye and around it, accompanied by some dimness of vision and redness and inflammation of the eye associated sometimes with moderate raising of the normal tension due to exudates in the aqueous fluid. The loss of sight is never so profound nor the rise of tension ever so grave as in acute glaucoma. The crucial test is the digital examination of the tension of the eye. In primary acute glaucoma alone, no one, however inexperienced, could fail to satisfy himself of the stony hardness of the eyeball.

Acute glaucoma comes on suddenly and severely in people, usually women, rarely below middle life; acute iritis comes on gradually, is seldom so severe, and is commoner in young people, usually young men aged from eighteen to thirty-five years.



The appearance of the eye differs in the two diseases. The pupil in iritis is contracted, grey and sluggish; in glaucoma it is dilated, oval and immobile. The cornea is bright and clear in iritis, oedematous and hazy in glaucoma.

It is seen from the above description that usually there is a wide gulf between the two conditions, and serious damage to the eye from wrong diagnosis and treatment should not occur. There are rare cases, however, which are doubtful even to the most experienced.

#### *Aids to Differential Diagnosis.*

While the crucial test is the digital palpation of the eye, there are two other tests which may be performed to confirm a diagnosis. Take a wisp of cotton wool and lightly touch the cornea with it. It will be found that in glaucoma there is no reflex, because the cornea is insensitive; but a brisk reflex follows in iritis. The other test is to make a "test dilatation" of the pupil of the affected eye. Do this if necessary when the patient is first seen, and do not leave him until the test is completed. Instil a drop of 2% aqueous solution of homatropine hydrobromide into the eye and wait for fifteen minutes. As the pupil dilates in acute iritis visible adhesions between the iris and the lens are revealed and the irregularities of the pupil margin are accentuated. If this test excludes iritis, instil a 1% oily solution of eserine immediately. Atropine is never used for "test dilatation", as it renders the myoneurium of the iris insensitive to the action of eserine.

#### *Immediate Treatment.*

In discussing the immediate treatment I refer to those emergency measures directed at the reduction of intraocular tension in the affected eye, prophylactic treatment of the other eye, and general medical treatment of the patient in bed, until the acute stages can be weathered, or failing that, until arrangements can be made for immediate operation.

This emergency medical treatment is not a substitute for surgical treatment, but an indispensable and invaluable preliminary aid, which it is the duty of the physician to render to his patient. Upon the promptness and vigour of his treatment depends the ultimate prognosis. A valuable service is rendered in preventing an acute attack in the unaffected eye.

The treatment of acute glaucoma is essentially aimed at the permanent reduction of intraocular tension. It is ultimately a surgical condition, and every patient who has an acute attack should be advised to have an operation, preferably a trephining operation, when the eye has been successfully nursed through the acute stage, or if medical measures are unavailing, a wide iridectomy during the acute stages.

Too often we see patients who have had an acute attack which has passed off with medical treatment left with, at best, regular treatment with weak miotics for their now chronic glaucoma. The fields of vision are gradually diminished, lens changes

advance, and a second more disastrous acute attack often supervenes. Other patients are discharged and completely neglected.

When a patient has an acute attack, so great is his discomfort and so grave is his anxiety about his sight that little difficulty is found in persuading him to submit to operation; but when the acute attack has passed he is very prone to evade operation, or if a simple posterior sclerotomy has been performed to relieve tension temporarily, to refuse the bigger and more permanent operation of iridectomy.

Theoretically, immediate wide iridectomy offers the best and most permanent reduction of intraocular tension. The operation, however, is a difficult one, and both the eye and the patient are in an unfavourable condition for operation. To hasten an elderly patient, exhausted with pain, anxiety and loss of sleep, and often with an irregular action of the heart, into immediate iridectomy for optical reasons alone is to treat the disease and not the patient.

If the patient has recovered from a previous acute attack without operation, or if one eye has already been lost or has been operated on for glaucoma, advise prompt operation. This is also the best advice if the patient is still in active life and requires acute vision. Do not dally too long with fulminating cases or those in which the lesion is resistant to miotics. If both eyes are glaucomatous at the same time operation must be performed immediately. This is an occasion when it is justifiable to operate on both eyes at once.

The sooner treatment is begun after the onset of the glaucoma, the better the ultimate visual result. There is no condition in practice that calls for more energetic treatment. If the iris is still capable of responding to the action of eserine, the contracted pupil may free the angle of the anterior chamber sufficiently to permit of some drainage. The tension falls below the danger limit and the retinal nerve elements do not perish. Up to twelve hours after the onset the iris usually still responds, and some lowering of tension may be expected after four hours' treatment. Between twelve and forty-eight hours after the onset the pupil may respond only in an irregular manner. It may fail to free the angle of the anterior chamber sufficiently for drainage, or the response may be ill sustained. It is therefore useless to hope for any fall of tension in these cases after twelve hours' treatment.

If the pupil fails to maintain contraction when treatment is relaxed, and if the ocular tension remains, iridectomy must be performed. Some few patients recover, at least for the time being, with conservative treatment or with at most scleral puncture in addition; but as a general rule if the disease in the acute stages can be treated without wide iridectomy, some operation to establish permanent drainage should be performed before the patient goes home. These delayed operations are those usually performed for chronic glaucoma.

In all cases treatment with miotics should commence at once, whatever the subsequent treatment adopted. One drop of a 1% solution of eserine in *Oleum Ricini* should be instilled into both eyes immediately, and the patient should be put to bed, if he is not already there. Hospital is the best place always for the treatment of acute glaucoma. The patient should be given 0.1 gramme (two grains) of calomel and a hypodermic injection of 0.01 gramme (one-sixth of a grain) of morphine sulphate on arrival at hospital. The calomel, and later a draught of saline solution, relieve congestion, and the morphine relieves the pain, induces rest and quells anxiety. These measures, apart from their general value, are prophylactic against the onset of acute glaucoma in the other eye.

The oily solution of eserine is instilled into the affected eye, one drop every half-hour for two hours, then one drop every hour for a further four hours. Thereafter one drop is instilled every four or six hours if the eye continues to improve. One drop of 0.5% aqueous solution of eserine sulphate should be instilled into the unaffected eye night and morning during the crisis, and once daily for long after, to keep the pupil small.

The oily solution of eserine is made in the following way. Thirty cubic centimetres (one ounce) of castor oil are warmed in a watch glass and then 0.3 gramme (four grains) of eserine alkaloid, previously dissolved in a little chloroform, are gently stirred in. The oily solution ensures more constant and prolonged action of the eserine. A small quantity of this solution, such as 7.5 cubic centimetres (two drachms), is a small thing to keep always on hand in the surgery or in the bag; it keeps indefinitely and may be used immediately while the drops are being made. Thus irritating and damaging delay is avoided.

The hypodermic injection of morphine sulphate may be repeated two or three times as required.

The eye should be bathed for ten minutes every hour for the first six hours, then every four hours, with water as hot as can be borne on the closed eye. These bathings are best carried out as "spoon bathings". A wooden kitchen spoon is padded in the bowl with lint. A basin of hot water is obtained. The spoon is dipped into the hot water, and the patient, sitting upright in bed, lifts the padded bowl of the spoon to the closed eye and applies it as hot as possible, repeating the process as soon as the heat is lost. This is a most comforting measure, and patients never fail to appreciate it. Nurses appreciate it too, as it requires no supervision, no messy dressings or bandages. For these reasons also it is much more likely to be carried out as frequently as the surgeon desires.

Short-wave diathermy is excellent if available.

A healthy leech or two, now seldom available, applied to the temple, half an inch from the outer canthus, under a moist pad, is an ancient but unassailably good treatment.

These measures never fail to make the patient more comfortable, but may fail to relieve the

glaucoma sufficiently. A watch must be kept on the eye; and if there is no sign of the pupil contracting evenly all round, and if no relief of tension is detectable in twelve hours with this treatment, it is unwise to wait any further and operation must be performed. The oily drops cannot be continued indefinitely, as they cause irritation to the eye, often nausea and later fatty acid conjunctivitis. Too much conservative treatment often adds a spasmodic entropion of the lower lid, with trichiasis to the already acutely affected eye, and this may cause delay by requiring operation for its relief before iridectomy can be done.

When patients have to be transported long distances to a city or a base hospital, a scleral puncture may be performed. This operation can be carried out without general anaesthesia or special instruments. It should be within the skill of anyone accustomed to general surgery. It is not recommended unless the case is so severe that without surgical interference before such an unavoidable delay all useful sight would assuredly be lost.

#### MIXED TUMOURS OF THE UTERUS.

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A "MIXED TUMOUR" has been defined as a neoplasm, the cells of which are foreign to the particular organ in which it is found. Considerable confusion has been caused by the description of mixed tumours of the uterus under composite names, such as chondrosarcoma (Hartfall<sup>(1)</sup>), rhabdomyosarcoma (Glynn and Blair Bell<sup>(2)</sup>), chondromyxosarcoma *et cetera*. Such names indicate the predominant heterogenous elements found in the particular tumour described; but since in mixed tumours many tissues, usually of mesodermal origin, are found and not all these tissues are present in every case, these composite names are unsatisfactory.

The term "botryoid sarcoma" is also confusing. In 1892 Pfannenstiel<sup>(3)</sup> described a tumour under the title of "*Das traubige Sarcom der Cervix Uteri*", and following this the term "botryoid sarcoma" came into general use. Mixed tumours of the uterus and vagina are very rare, and when they do occur are sometimes botryoid in form, but most often are not. Also many pure sarcomata without any heterogenous elements have a grape-like formation, and they are comparatively benign compared with mixed tumours of the uterus, which are intensely malignant. The term botryoid refers to the morphological characteristics of the tumour, and a nomenclature based on histological rather than morphological features is more satisfactory.

Some authors (Meikle,<sup>(4)</sup> Perlstein<sup>(5)</sup>) adopt the term "mesodermal mixed tumours", indicating that the origin of the heterogenous elements is the mesoderm. Whilst this is undoubtedly true of the



majority of the tumours, I consider that a reasonable doubt does exist concerning the origin of the glandular and epithelial elements found in some tumours. Meikle<sup>(4)</sup> and others consider that the glandular elements are inclusions, and many undoubtedly are. However, the glands described by Wolfe<sup>(6)</sup> and the epithelial structures of Kistler<sup>(7)</sup> are not, in my opinion, proven inclusions. Also Klein<sup>(8)</sup> and Wolfe<sup>(6)</sup> have described nerve tissue in their tumours, and though the forerunners of these elements may have been split from the ectoderm to form the mesenchyme, as Meikle<sup>(4)</sup> argues, I consider the term "mixed tumours" more accurate and sufficiently descriptive.

Lackner and Krohn<sup>(9)</sup> have described a teratoma of the cervix, with tissues derived from all three embryonic layers. This, however, is more likely to be the result of an incomplete miscarriage with implantation of portion of the foetus in the cervical wall, and the authors admit this possibility.

Mixed tumours of the uterus closely resemble Wilms's tumour and somewhat similar tumours of the prostate, which are not common; but mixed tumours of the uterus and vagina are very rare indeed.

The outstanding characteristics of these neoplasms, whether they arise in the uterine body, the cervix or the vagina, are their intense malignancy and the presence of heterogenous tissues.

Mixed tumours of the uterine body usually occur after the menopause, those of the cervix during active menstrual life, and those of the vagina during infancy. There are exceptions. Frau Kascheworowa<sup>(10)</sup> reported a vaginal tumour in a girl of fifteen years, and Richter's<sup>(11)</sup> cervical tumour occurred in an infant of two years. Herb<sup>(12)</sup> mentions two cervical tumours in children, aged two and four years respectively. I do not intend to discuss the vaginal mixed tumours here. According to Shaw<sup>(13)</sup> the average age of women with cervical tumours is thirty-four years, and Nicholson<sup>(14)</sup> estimates the average age of women with corporeal tumours as fifty-three years.

Earlier writers, in summarizing the literature, were of the opinion that the cervical mixed tumours were commoner than those arising from the body; but Meikle<sup>(4)</sup> in 1936 carefully analysed the literature and found that in cases in which the site could be determined with reasonable accuracy, forty-five originated in the body and thirty-one in the cervix.

Cervical tumours infiltrate and metastasize earlier than those of the body. In this they resemble other malignant neoplasms of the uterus. In connexion with this it is curious that microscopically the growth is very seldom seen penetrating into the musculature of the body or cervix (Maslen Jones,<sup>(15)</sup> Shapiro,<sup>(16)</sup> Cox and Benishek<sup>(17)</sup>). Rarely do the tumours of the body extend to the cervix, nor does a cervical tumour spread to the body.

The origin from the cervix is usually by means of a pedicle from one or other lip; rarely is the origin

diffuse. The tumour described by Maslen Jones<sup>(15)</sup> had a curious annular origin from around the external os. Body tumours arise from a broad base anywhere in the cavity and tend to become polypoid. They are practically all submucous in origin; an unusual tumour was that described by Shapiro,<sup>(16)</sup> and it apparently arose in a preexisting subperitoneal fibroid associated with other fibroids.

Only six patients had associated fibroids. Five were in the *corpus uteri* (Shapiro,<sup>(16)</sup> Wolfe,<sup>(6)</sup> Nicholson,<sup>(14)</sup> von Franqué<sup>(18)</sup>) and one (Meikle<sup>(4)</sup>) in the cervix.

It would appear that parity plays no part in aetiology. Most corporeal neoplasms reported have occurred in parous women, but as these tumours usually occur after the menopause it is natural that most of these women have had children. Those arising in the cervix occur as frequently in nulliparous as in parous women, and many occur before the marriage age. In this respect mixed tumours differ from carcinomata of the uterus.

The tumours, when arising in the body of the uterus, may do so from any portion of the cavity, and seldom assume the botryoid form. They may have a diffuse origin, or may arise by a pedicle. Their general formation is polypoid, but on account of the confined cavity in which they grow, their formation is more compact than is the formation of those growing into the vagina. Keitler's<sup>(19)</sup> corporeal tumour was definitely botryoid, Perlstein's<sup>(6)</sup> partly so; but Nicholson<sup>(14)</sup> maintains that his tumour was composed of multiple independent polypi. The lower portions of the tumours are usually very hæmorrhagic and necrotic, and may even be gangrenous (Hartfall<sup>(11)</sup>). Large translucent areas are seen, and in Petersen's<sup>(20)</sup> case cartilage was visible to the naked eye. The tumours fill and expand the uterus, and are often larger than those of the cervix, probably because symptoms are not recognized so early.

When arising in the cervix the condition is often mistaken for a simple polypus; and even when the polypi recur, often no clue can be obtained by the naked eye; but repeated histological examinations will usually reveal their true nature.

Sometimes the tumours occur in a botryoid formation when growing into the vaginal cavity. This botryoid formation, according to Kolisko,<sup>(21)</sup> is due to œdematous infiltration of the polypus, produced by traction or torsion of the pedicle. Also a roomy cavity, such as the vagina, appears necessary for the grape-like expansion. The growth may expand and fill the vagina, and may even protrude at the vulva. Portions may be passed *per vaginam*, or may come away with the examining finger. Areas of necrosis and hæmorrhage are common. When locally removed, these tumours rapidly recur and infiltrate.

In practically all the mixed tumours which have been reported, whether arising from the uterine body or cervix, there is a connective tissue stroma of homogenous myxomatous appearance which bears

a strong resemblance to Wharton's jelly. The acetic acid test for mucin has been performed by some observers in an endeavour to prove the myxomatous nature of this tissue; some report a positive result to the test, others a negative result. This negative result has led some authors to believe that this tissue is oedematous (Murray and Littler<sup>(22)</sup>) and not myxomatous. However, Nicholson<sup>(14)</sup> found that a positive result to the mucin test was obtained only in the older and more fully developed portions of his tumour. The majority of observers consider that this tissue is embryonic mesenchyme, and that the other constituents of the tumour arise from it (Wilms,<sup>(23)</sup> Shaw,<sup>(13)</sup> Nicholson<sup>(14)</sup>).

This embryonic tissue consists of a loose interlacing network composed of the protoplasmic prolongations of stellate cells containing round pale nuclei. In the meshes of the network is a clear or finely granular and sometimes eosinophilic substance. Nicholson<sup>(14)</sup> has described the formation of cartilage from this tissue.

Hyaline cartilage is one of the most characteristic features of these tumours. It is a very immature type and has been compared with that found in the foetus (Perlstein<sup>(5)</sup>). It occurs in small islands, which may coalesce, and there may be a perichondrium of spindle cells (Shaw<sup>(13)</sup>). Meikle<sup>(4)</sup> and Hartfall<sup>(1)</sup> have described a transition from spindle cells to cartilage; Perlstein<sup>(5)</sup> considers that the cartilage arises from round cells. Nicholson's<sup>(14)</sup> description of the formation of early cartilage is applicable to that seen in the tumour to be described below. He writes:

At suitable spots its cells (i.e., the stellate cells of the embryonic tissue) become large and rounded. The matrix between them increases in amount, forms spaces for them to lie in and is condensed as capsules around the oldest cells of the nodule.

This cartilage in its newly formed state is strongly eosinophilic.

In Kistler's<sup>(7)</sup> tumour the cartilage appeared to arise from the fibrous and smooth muscle stroma stalks, and no myxomatous tissue was present. Hartfall<sup>(1)</sup> suggests that abnormal stimuli in the presence of local impaired nutrition may produce cartilage.

In Figure V cellular debris may be seen together with multinucleated hyperchromatic cells and cartilage. This type of giant cell was found only near cartilage. A somewhat similar appearance has been described by Kolodny<sup>(24)</sup> in certain bone neoplasms. It is not clear whether these multinucleate cells are concerned with the building up or the disintegration of cartilage. Conversion into osteoid tissue is rare, but has been described (Nicholson,<sup>(14)</sup> Hartfall,<sup>(1)</sup> Petersen<sup>(20)</sup>).

Clusters of small round cells resembling lymphocytes are usually scattered throughout the myxomatous tissue, together with some spindle cells. The nuclei are large and darkly staining in both. It is thought that the small round cells arise from the myxomatous tissue and that they differentiate into the various heterogenous tissues found in these

tumours. Maslen Jones<sup>(15)</sup> detected transitional stages between round and spindle cells. Fat has been described in some tumours (Nicholson,<sup>(14)</sup> Petersen<sup>(20)</sup>), and it is thought that when fat is present in considerable quantities the tumour is less malignant.

Blood vessels are usually abundant, and consist of a single layer of endothelium. Haemorrhage into the tissues is common, and this vascularity is a factor in the extreme malignancy of these tumours. One of Hartfall's<sup>(1)</sup> tumours was comparatively avascular, and the patient was alive and well five years after operation.

Definite striated muscle cells have been found by some observers (Shaw,<sup>(13)</sup> Lochrane,<sup>(26)</sup> Herb,<sup>(12)</sup> Cox and Benishek<sup>(17)</sup>), but usually with difficulty. Some have found longitudinal striations only. However, in a number of tumours cells have been described which are probably myoblasts (Shapiro,<sup>(16)</sup> Glynn and Blair Bell<sup>(2)</sup>). Capell and Montgomery<sup>(28)</sup> have described the development of myoblasts from a primitive round cell through a spindle cell to a multinucleate syncytial muscle fibre. They state that in the absence of striation the myoblast may be recognized as a large acidophile cell, usually spindle-shaped, but sometimes ribbon or tadpole shaped, with one broad end and a short curved tail. They are frequently, but not always, multinucleated, with a vesicular oval nucleus and well-marked chromatin knots. When the nuclei are multiple they may be clustered at one end of the cell, or may be in a cigar-shaped row either in the centre of the cell or along one edge. Van Geison's stain may bring out muscle fibres which cannot be identified by other staining methods.

Smooth muscle is occasionally found (Kistler,<sup>(7)</sup> Nicholson<sup>(14)</sup>), but it is not a heterotopic tissue and is not of such importance. Nerve tissue has been described on two occasions (Klein,<sup>(6)</sup> Wolfe<sup>(9)</sup>).

Glands are common and are usually of the endometrial or cervical type, sometimes hypertrophied and sometimes atrophied. Many observers consider them to be inclusions of normal glands. The epithelial covering of most tumours is complete, and when the growth arises in the *corpus uteri* it consists of columnar epithelium; and when the origin is in the cervix, the epithelium is usually squamous or transitional. Some areas of necrosis of the epithelium are seen, probably due to pressure.

Metastases occur late in the course of the disease and may be remote or local, but often the patient dies before metastases can form. Malignancy bears no relation to local infiltration; the tumours with narrow pedicles are quite as malignant as those with a diffuse origin.

In nearly all cases a local abdominal extension is found, which may fill the pelvis and is often necrotic. When remote metastases are found, they usually occur in the lungs and bones, indicating a blood-borne dissemination.

The histology of the remote growths is simple, and the various heterogenous tissues that occur in the parent tumour are seldom found. Usually these









ILLUSTRATIONS TO THE ARTICLE BY DR. A. R. H. DUGGAN.

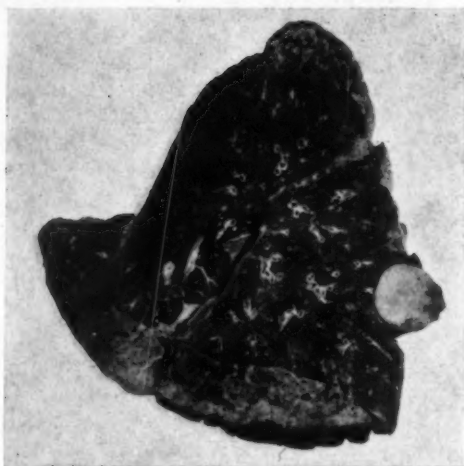


FIGURE I.

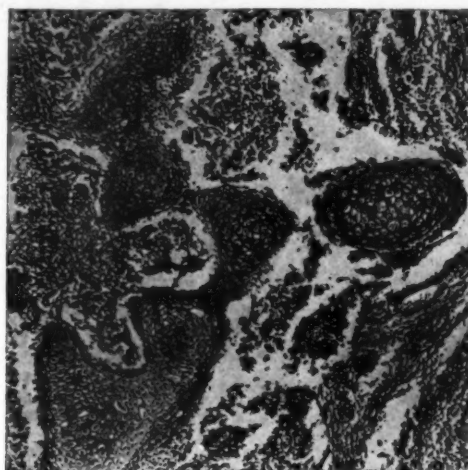


FIGURE II.

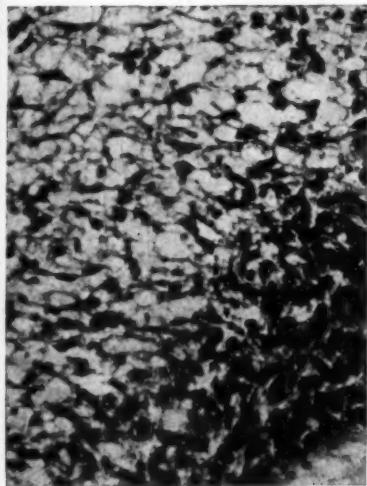


FIGURE III.

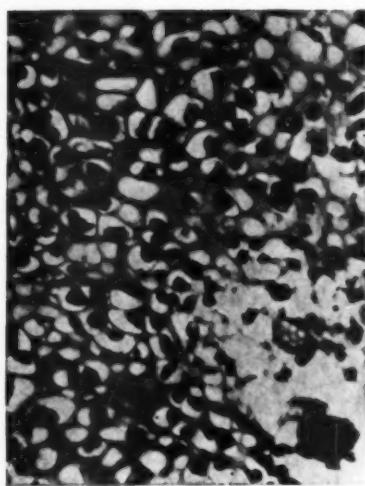


FIGURE IV.

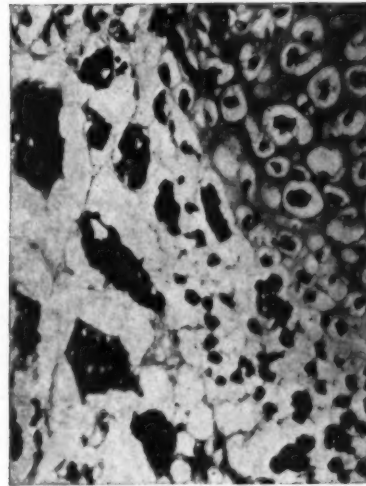


FIGURE V.

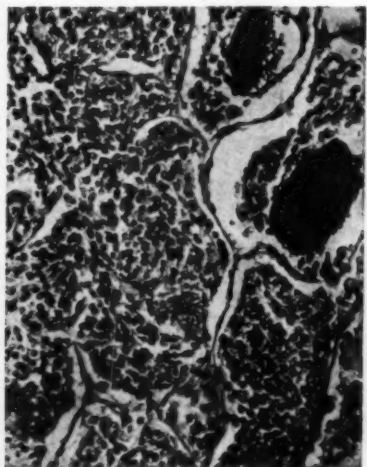


FIGURE VI.

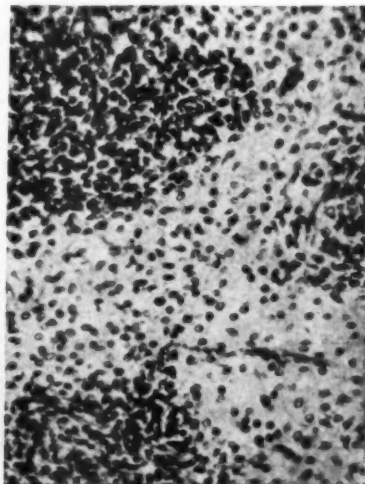


FIGURE VII.

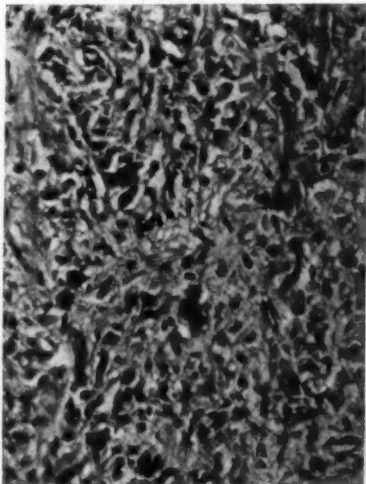


FIGURE VIII.

ILLUSTRATIONS TO THE ARTICLE BY DR. REGINALD WEBSTER.



FIGURE XXXV.  
Lymphosarcoma of the caecum: metastasis in retro-colic lymph glands.

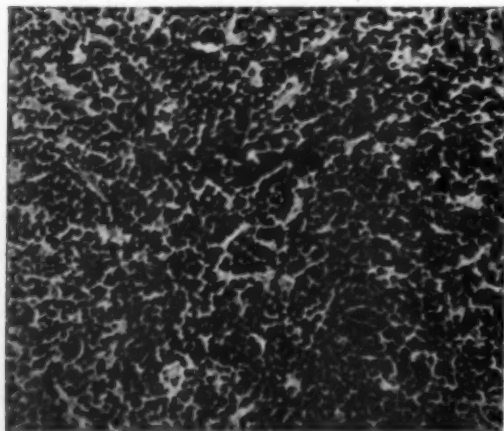


FIGURE XXXVI.  
Photomicrograph of a section from the tumour shown in Figure XXXV. Low power. Homogeneous small round-celled growth.

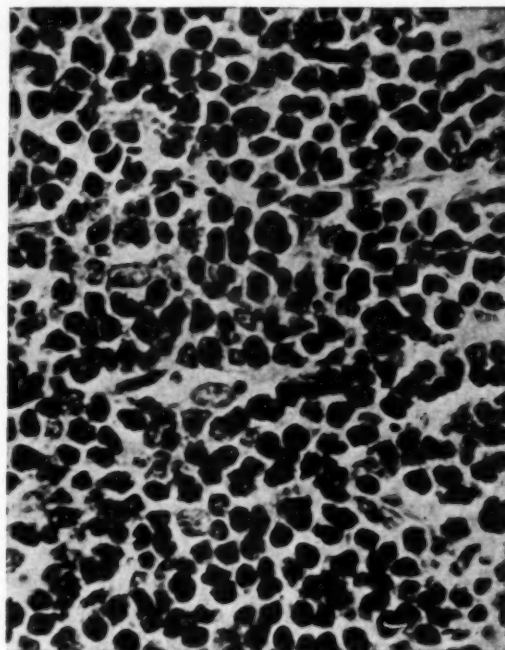


FIGURE XXXVII.  
High-power photomicrograph of a field from Figure XXXVI.

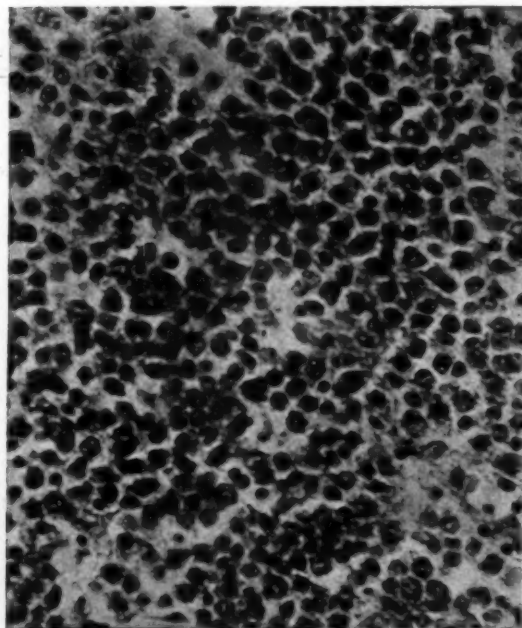


FIGURE XXXVIII.  
Lymphosarcoma of caecum: 1915 tumour.





VI.







remote metastases take the form of a round or spindle-cell sarcoma. Occasionally they consist of tissues not recognized in the primary growth at all. Cartilage has been found in a few cases. Hartfall<sup>(1)</sup> reports a patient in whom there was no recurrent lesion anywhere in the pelvis or vagina, but there was a huge lobulated metastasis occupying the whole of the left pleural cavity. Heddaus<sup>(27)</sup> reported a remarkable metastatic growth in the lung, which not only reproduced the botryoid character, but also the heterogenous tissues of the parent tumour. He considered it to be the result of the dissemination of undifferentiated embryonic tissue.

McCann<sup>(28)</sup> quotes a recurrence in the vaginal wall after total hysterectomy, very similar to the tumour described below.

#### Report of a Mixed Tumour.

L.H., single, aged twenty-seven years, was first seen on September 30, 1937. The relevant history was as follows. In January, 1937, a cervical polypus had been removed; this had recurred and was again removed in June, 1937. The hospital at which these polypi were removed has no record of their histological examination. Soon after her discharge from hospital she noticed irregular increasing hæmorrhage; and in August, 1937, another polypus appeared at the vulva. Between periods there was an offensive white vaginal discharge. Frequency of micturition and constipation had been present for four months, and she was always languid and tired. There was slight intermittent pain in the right iliac region.

On examination no tenderness or tumour was discovered on palpation of the abdomen. The introitus was narrow and the vagina normal. A soft red polypus, about 5.0 centimetres (two inches) long, arose by a narrow pedicle from the right lateral aspect of the cervix near the external os. This polypus was somewhat necrotic and bled easily on contact. The lungs and heart were normal; no abnormality was discovered in the alimentary or nervous system; the teeth were carious and in very bad condition. Blood and pus were present in the urine.

On October 6, 1937, under general anaesthesia, the polypus was removed, together with a small portion of the cervix. The report on this polypus from the Sydney Hospital pathological department was as follows:

Macroscopically the specimen measured 3.5 centimetres by 3.5 centimetres by 1.0 centimetre. It was oedematous and myxomatous in appearance, and there was a whitish area present at the base.

Microscopically sections show an oedematous fibroadenomatous polypus, which is undergoing myxomatous degeneration. The adenomatous element is not conspicuous, nor is there any evidence of carcinomatous change. The base of the polypus is very cellular, and some of the cells show unusual activity, suggesting a possible sarcomatous change.

Professor Welsh has seen these sections and advises that in view of the history and histological appearances it would be advisable to do a hysterectomy.

On October 27, 1937, a pan-hysterectomy was performed, the operation presenting no special difficulty. A cuff of vagina was removed with the specimen. Unfortunately the uterus was not kept for examination.

On February 20, 1938, this patient was readmitted to hospital. She complained of irregular hæmorrhage from the vagina for four weeks, with occasional flooding. There was an offensive brown discharge, also scalding and frequency of micturition. She had lost 2.25 kilograms (five pounds) in weight since October, 1937. On examination a small polypus was found in the right upper portion of the vagina, springing from the outer end of the scar

in the vault. This polypus was very soft and hæmorrhagic, and portions came away on the examining finger. No metastases were revealed in the lungs by X rays; there was no palpable tumour in the abdomen, nor could any signs of metastases be discovered anywhere.

On February 23, 1938, this polypus was removed under general anaesthesia and 50 grammes of radium were applied by plaque and colpostat to the vaginal vault and left in for 100 hours. She was given three treatments of deep X ray therapy, but refused to finish the course owing to severe vomiting and weakness.

Macroscopically the polypus consisted of soft hæmorrhagic tissue measuring 1.2 centimetres by 1.0 centimetre. It was bisected and both halves were embedded in paraffin. The hospital report was as follows:

The structure varies in different parts. Some areas are extremely cellular, the cells showing pleomorphism, and some showing a tendency to spindle-shaped formation. Others are undifferentiated and rounded in type. All these cells are grouped in masses in a stroma which in parts appears oedematous, but in others shows a stellate formation suggesting a myxomatous change. For the most part the polypus shows a covering of epithelium of varying depth and squamous in character, but in no part of any great thickness.

In some areas scattered throughout the same stroma are areas of embryonic cartilage staining deeply with eosin. Small round cells resembling lymphocytes are scattered through the stroma, and giant cells with very little protoplasm are seen, some of them showing hyperchromatic nuclei. In the areas where cartilage is found the giant cells are numerous, and the collections of spindle and large round cells relatively scanty, but small cells of the lymphocyte class are fairly numerous.

On these histological appearances a diagnosis of mixed tumour was made. I then had numerous sections cut, both of this polypus and of that removed in October, 1937, and under the microscope discovered several interesting features.

In both polypi "the oedematous tissue undergoing myxomatous degeneration" described in the hospital reports is undoubtedly the embryonic tissue which is present in practically all of these tumours (Figure III). The "oedematous" and "myxomatous" features have been noted by most observers and have been the basis of much argument as to the true nature of this tissue. Also in the first polypus are large round cells whose protoplasm stains deeply with eosin and which may contain one (usually) or two nuclei. These I consider are myoblasts; and Mr. Wilfred Shaw,<sup>(29)</sup> who has examined these sections, is of the same opinion. It was found on further examination that glandular elements were more numerous in the first polypus than was thought; but they do not appear neoplastic in any way. It is curious, however, that the round and spindle-shaped cells are usually bunched in dense masses around these glands. The cells lining the gland spaces very closely resemble those of ordinary cervical glands.

The blood vessels are numerous and consist of a single layer of flat endothelium with practically no supporting tissue. The cartilage is embryonic in type, and the older portions appear to have a thin irregular perichondrium of flattened cells; but the early developing cartilage merges imperceptibly into the fibrillar embryonic tissue and the round cells, from which it appears to be developing. The giant cells are numerous in these areas, and contain many thickly bunched hyperchromatic nuclei (Figures II, IV and V). No cartilage was seen in the first polypus.

The covering epithelium is not complete, most probably because of hæmorrhage and necrosis. The majority of it is squamous, but portions of it are indistinguishable from transitional epithelium.

On July 11, 1938, this patient was readmitted to hospital in an emaciated state. Diarrhoea and vomiting had been present for a month, and frequency of micturition and dysuria were severe. There had been no return of the vaginal hæmorrhage.

A large firm abdominal tumour extended from within the pelvis to the umbilicus, but there was no evidence of growth in the vagina. The patient was moribund, and a full physical examination was not made. She died on July 14, 1938. An autopsy was performed six hours after death and reported on as follows:

The body was that of a young woman, though the general appearance was that of a person many years older. It was much emaciated (weight 34.5 kilograms). There was present a scar (15.0 centimetres in length) of a lower median abdominal incision. The skin of a large part of the body, especially of the extremities, was the site of a scaly eruption. The lower part of the abdomen was protuberant owing to underlying tumour. *Rigor mortis* was not present.

The entire pelvis and lower part of the abdominal cavity were filled with a friable and necrotic growth, the overall dimensions of which were about 20.0 centimetres by 15.0 centimetres by 15.0 centimetres. It was impossible to remove the growth entire. Some parts of it were white, others red. It had surrounded and occluded both ureters, the walls of the bladder and rectum were invaded, but complete penetration had not occurred. Suppuration had occurred in the portion of growth immediately in front of the sacrum. The vault of the vagina was free from growth. The uterus, tubes and ovaries had been removed previously at operation.

There was some excess of fluid in the peritoneal cavity (about 300 cubic centimetres). Numerous nodules of growth were present on the peritoneum. In the lower part of the abdomen they were up to 0.5 centimetre in diameter, whilst in the upper part of the peritoneal cavity they were smaller. On the falciform ligament and diaphragmatic peritoneum there were some very small white plaques, but these did not have the appearance of metastases. There were several especially large metastases (up to 1.5 centimetres in diameter) on the peritoneal surface of the sigmoid colon. The omentum also contained many nodules of growth, the largest being 2.0 centimetres in diameter.

The oesophagus and stomach presented no abnormalities (apart from metastases on the surface of the latter organ). The peritoneum covering the intestines was the site of metastases and the pelvic colon and rectum were surrounded by growth (as noted above).

The liver showed congestive and slight fatty changes. There were no metastases within its substance, but some were adherent to its peritoneal surface.

The spleen was slightly enlarged (weight 171 grammes), soft and diffuent. There was one small white area, just beneath the capsule; but this did not, however, look like metastasis.

The right kidney was the site of multiple metastases, especially in the lower pole. Some of these had ulcerated into the pelvis and had become infected. In one situation on the anterior aspect of the kidney there was a small perinephric abscess which had formed by spread of the inflammatory process from the parenchyma; the pus was of thick creamy consistency and of slightly greenish colour. The right ureter was obstructed by growth just below the pelvic brim. Above this point it was grossly dilated (up to 1.5 centimetres in diameter) and was filled with purulent fluid. The pelvis and calyceal system were also distended with similar fluid (pyonephrosis).

There were many small whitish areas of irregular shape in the cortex and medulla of the left kidney; whether they were metastases or abscesses could not be decided on naked eye examination. The left ureter was somewhat dilated, and, like the right ureter, was surrounded by growth in the pelvis.

There was no excess of fluid in either pleural cavity and they were free from adhesions. On the pleural surface of the sixth rib in the anterior axillary line there was a hemorrhagic metastasis 5.0 centimetres by 3.0 centimetres in superficial measurement. This had apparently grown in the rib, which was much softened.

Similar (though smaller) metastases were present in the third and fourth right ribs near the vertebral column.

Both lungs were very light. The right lung weighed 220 grammes. There was a spherical nodule of growth (3.0 centimetres in diameter) in the lower lobe immediately beneath the pleura. On cutting into this it was found to be white and firm. Other small subpleural nodules were also present, and on the peripheral margin of the lower lobe were many pedunculated reddish nodules up to about 0.5 centimetre in diameter.

The left lung weighed only 170 grammes. One definite nodule of growth was present in the upper lobe and there were several small reddish subpleural plaques, the nature of which was uncertain without microscopic examination.

There was no excess of fluid in the pericardial cavity. The epicardial fat was rather gelatinous in appearance. The heart was atrophic (weight with pericardium 200 grammes). Neither the myocardium nor the valves presented any abnormality.

The brain showed marked oedema of the pia-arachnoid, but there were no intracranial metastases.

There were no visible or palpable metastases in the vertebral bodies or pelvic bones.

No enlarged lymph nodes were encountered.

On microscopic examination sections from the pelvic mass present varying appearances. In portion the structure is that of a malignant connective tissue newgrowth. The majority of the cells have practically no cytoplasm; their nuclei are large oval or spindle shaped, and present a moderate degree of variation in size and shape. There are also some multinucleated giant cells with strongly eosinophilic protoplasm and large irregular nuclei, which are thickly clumped together and not arranged in any particular way. There is also a large amount of adipose tissue, which may be anatomical fat being invaded by tumour cells, or may be heterogenous. Wilfred Shaw<sup>1</sup> is inclined towards the latter view. No tissue resembling cartilage is to be seen. Mitotic figures are not very numerous. The reddish part of the pelvic tumour is entirely necrotic.

In the nodule from the sigmoid colon there is again a considerable amount of adipose tissue, which has the appearance of being invaded rather than of being part of the tumour growth. Giant cells similar to those seen in the pelvic mass are present. The predominant cell is again the small cell with large oval or spindle shaped nuclei. Here also are a few areas of those lighter staining cells to be described more fully in the lung sections.

In the small nodule from the left lung clumps of tumour cells are to be seen invading the alveoli. At the periphery of the nodule there are some large thin-walled vessels actually in the tumour masses within the alveoli (Figure VI). Portion of the wall of a small bronchus is included in the growth. There is also an island of very peculiar tissue in which round vesicular nuclei are separated widely by fibrillar eosinophilic substance (Figure VII).

Similar tissue is to be seen in much larger masses in the large nodule in the right lung (Figure I). The predominant cell in this metastasis has an ovoid nucleus and practically no visible cytoplasm (Figure VII). No giant cells were seen.

The small reddish plaques immediately below the pleura in the left lung are very vascular metastases. In the one examined a transition (which was not present in the large nodule) can be seen from the relatively acellular eosinophilic tissue described above to the very cellular type of growth. The only additional feature presented by the small nodule from the upper lobe of the right lung is the presence of a plug tumour with large thin-walled blood vessels in the lumen of a bronchiole.

The large mass from the lower right lobe presents varying appearances. At the periphery permeation of alveoli is apparent. A small bronchus which has been included in the growth is also seen. Whilst parts of this metastasis are composed of densely packed cells of the type seen in the pelvic growth, there is a very large



amount of the eosinophilic tissue described above. Occurring in this tissue and not at all (as far as can be seen) in the more cellular areas are some spaces lined by cubical epithelium. The nature of these structures is open to more than one interpretation, but they are more likely to be the remains of pulmonary alveoli than structures formed by the growth. All sections examined showed numerous thin-walled vessels.

The nodules at the free margin of the right lung are vascular hæmorrhagic metastases.

The nodule from the sixth rib is a hæmorrhagic metastasis. A small area of the peculiar eosinophilic tissue is present and an occasional multinucleate cell. The predominant cell is again the small cell with the large darkly staining ovoid nucleus.

The whitish areas in the left kidney are inflammatory (pyelonephritis) and no tumour cells are to be seen in sections from this kidney.

The histological appearance of the right kidney is interesting (Figure VIII). There is some fibroblastic tissue, and inflammatory reaction has occurred around and in a metastasis, making interpretation difficult. There are several multinucleate cells, the nuclei being bunched in some; in others they are arranged at one end of the cell, the cytoplasm then tapering to a point. In others the nuclei are in a row, the cell being spindle-shaped. The cytoplasm in these cells stains well with eosin, and I consider they are myoblasts. They appear to me to be identical with the myoblasts described by Capell and Montgomery.<sup>20</sup> In this area also some cells present appearances suggestive of longitudinal striation; but I could not identify muscle fibres in sections stained with Van Gieson's stain.

#### Discussion.

The histogenesis of mixed tumours is unknown. Several theories have been advanced, the most popular being a modification by Wilms<sup>(23)</sup> of Cohnheim's theory of cell rests. Wilms considers that the Wolffian duct in its backward growth carries with it some mesodermal cells which are deposited *en route*. At a later date some unknown stimulus causes growth of these cells, with consequent mixed tumour formation. To explain the varying position of these tumours in the genital tract Meikle<sup>(4)</sup> postulates migration of these cells from the original course of the Wolffian duct. The objections to this theory advanced by some observers are the long periods during which these cell rests remain dormant, and the much greater malignancy of mixed tumours in the urogenital tract than elsewhere. But the stimulus to growth may be hormonal, and different hormones may act at different stages of development and with varying effects. Other authors favour the theory of metaplasia. Perhaps cartilage can arise by metaplasia from connective tissue; but it is difficult to see how striated muscle could arise from smooth muscle, and the change has never been proved. The difficulty in differentiation between the early forms of striped and smooth muscle has caused some confusion in this regard. Gerode<sup>(30)</sup> and Nehrkorn<sup>(31)</sup> have observed striped muscle in the uterus, but not in connexion with any neoplastic change.

Nicholson<sup>(14)</sup> is of the opinion that some unknown stimulus acts on indifferent cells left over in the building up of the uterus, causing rapid proliferation and dedifferentiation of these cells right back to the mesodermal stage. The stimulus then ceases and the mesodermal cells proliferate into a mixed

tumour. I find it somewhat difficult to imagine why the stimulus should cease at the mesodermal stage of dedifferentiation.

However, all these theories are theories only, and we do not know how or why these tumours originate. Perhaps in the future an endocrine key will be discovered which will unlock this puzzle for us.

The symptoms of mixed tumours of the uterus are similar to those of other malignant uterine neoplasms. The most common symptom is irregular and often profuse hæmorrhage, accompanied by a watery discharge, which later becomes offensive and purulent. Lower abdominal pain may be present, also backache and a feeling of weight in the pelvis. Portions of the tumour may be passed *per vaginam*, or the growth may appear at the vulva if arising from the cervix. Late symptoms include those arising from pressure on the bladder and urethra, but the growth rarely involves the rectum. Sometimes hydronephrosis occurs from stricture of the ureters by the growth. Anæmia, emaciation and cachexia occur in the later stages. The diagnosis on clinical grounds in the early stages is usually impossible, and when the growth arises as a cervical polypus even microscopic diagnosis is often very difficult. The sections taken of the polypus may miss a malignant area, or the interpretation may be indefinite. Several cases have been described in which the original polypus was examined and reported to be benign. Similarly curettage of the uterus may miss an early corporeal growth.

If cartilage is seen in a cervical polypus the diagnosis is fairly obvious; other positive signs are the characteristic embryonic tissue and striped muscle cells or myoblasts as described above.

Some mixed tumours bear a superficial resemblance to hydatidiform mole; in this condition, however, the vesicles are usually much smaller. Recurrences of a cervical polypus should always arouse suspicion, and every cervical polypus removed should be submitted to a thorough examination under the microscope.

Mixed tumours of the uterus are extremely malignant and have been compared with chorion-epithelioma. Very few patients have survived two years after operation, though von Franqué<sup>(18)</sup> reports a case in which the patient was free from recurrence ten years after operation; and Hartfall<sup>(1)</sup> has a patient alive and well five years after operation. The average length of life following operative treatment is approximately twelve months.

It would appear that tumours containing large amounts of fat, or those which are relatively avascular are of less malignancy than those in which cartilage appears. These latter are always highly malignant. The cervical growths infiltrate and metastasize earlier than the corporeal tumours. In this connexion it is interesting to note that infiltration of the uterine or cervical tissues is seldom seen under the microscope. Death in the majority of cases is due to cachexia, rarely from the effects of pulmonary metastases.

Up to the present time radical hysterectomy has been regarded as the treatment of choice. The results have been bad in the vast majority of cases, whatever method of treatment has been adopted. Shaw<sup>(18)</sup> and Sophian<sup>(32)</sup> consider that mixed tumours of the uterine body would probably be better treated by radium. I am of the opinion that all mixed tumours, whether of the body or cervix, might be better treated by radium and X ray therapy than by surgery. The radiosensitivity of Wilms's tumour is very high, and mixed tumours of the uterus are very closely allied to Wilms's tumour. There is very little mention of X rays or radium in the literature of mixed tumours, and the method does not appear to have been given an adequate trial as yet. Certainly post-operative X radiation should be employed if radical hysterectomy is performed. No other therapy besides radical surgery or X radiation presents any hope of success.

#### Summary.

1. The nomenclature is discussed and reasons are given why the simple name of mixed tumours is preferable to the composite names often used.

2. The extreme malignancy and rarity of these tumours and the site of origin are noted, and it is pointed out that the botryoid formation is not usual.

3. It is shown that the condition is often mistaken for a simple recurring polypus, and repeated histological examinations are necessary to establish its true nature.

4. The macroscopic and microscopic features are described, and the several heterogeneous tissues of mixed tumours are discussed.

5. A case of mixed tumour is reported, and the macroscopic and microscopic features are described. Amongst other heterotopic tissues cartilage and myoblasts were found.

6. The theories of histogenesis are discussed and the theory of cell rests activated by an unknown hormone is preferred.

7. The symptoms, diagnosis, prognosis and treatment are described, and a hope is expressed that combined radium and X ray therapy will be given a trial, as all other methods result in a very high mortality rate.

#### Acknowledgements.

I wish sincerely to thank Mr. Wilfred Shaw, of London, and Professor W. K. Inglis, Dr. C. H. Shearman and Dr. A. Gillies, of Sydney, for their helpful criticisms of my histological interpretations.

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#### Legends to Illustrations.

- FIGURE I.—Photograph of the cut surface of the right lung, showing large round metastasis in the lower lobe.
- FIGURE II.—Embryonic cartilage found in the recurrent polypus, seen under the low power of the microscope.
- FIGURE III.—Embryonic myxomatous tissue together with a cluster of round cells near a gland. View of polypus under the low power of the microscope.
- FIGURE IV.—Early developing cartilage of recurrent polypus. Seen under the high power of the microscope.
- FIGURE V.—Early cartilage, also hyperchromatic multinucleate cells, small round cells and cellular debris in recurrent polypus. Seen under the high power of the microscope.
- FIGURE VI.—Metastasis from the left lung. Seen under the high power of the microscope.
- FIGURE VII.—Two types of cells found in the metastasis in the right lung. Seen under the high power of the microscope.
- FIGURE VIII.—Metastasis of the right kidney, showing multinucleate cells which are probably myoblasts. Seen under the high power of the microscope.



## Reports of Cases.

### **PATHOLOGICAL REPORTS FROM THE CHILDREN'S HOSPITAL, MELBOURNE.**

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#### **XIX: SARCOMA OF THE CAECUM.**

To open a discussion on sarcoma of the caecum with a remark on the rare occurrence of this type of intestinal neoplasm seems very conventional and rather like beginning a story with "once upon a time"; but lack of inspiration suggesting a more original approach to the subject compels me to adhere to the established formula. Two specimens of sarcoma of the caecum in the pathological museum of the Children's Hospital, Melbourne, one almost the oldest specimen on its shelves and the other one of its latest acquisitions, provide the basis of another report in the present series, and are the only two of their kind to have come within my experience.

The child from whom the recent example was obtained, a boy, L.W., aged eight years, was admitted to the Children's Hospital on November 17, 1938, under the care of Dr. H. Douglas Stephens, having been examined in private consultation by Dr. Ian Wood. For the two preceding months the boy had suffered recurrent attacks of severe abdominal pain. The pain was attended by vomiting at its onset, and usually persisted for two or three days. Until fourteen days prior to the child's admission to hospital the bouts of pain were of fortnightly frequency, but since the date indicated they had occurred bi-weekly. During the last attack the patient had passed much blood, but blood or mucus had not formerly been observed in the motions.

In the note which he sent with the boy to the Children's Hospital, Dr. Ian Wood drew attention to a mass which he had detected in the abdomen, immediately above the umbilicus. The lump was rounded, about five centimetres in diameter, and of a stony hardness. A smaller, softer and slightly tender mass was present below and to the right of the umbilicus. Dr. Wood was of opinion that the most probable diagnosis was that of chronic intussusception and that the child's general condition indicated the necessity for laparotomy within twenty-four hours. Dr. H. Douglas Stephens concurred in this view and operated immediately. He found the upper mass to be comprised of enlarged and aggregated lymphatic glands, and the caecum to be the site of a large tumour, which overhung the terminal portion of the ileum in such a manner as to suggest the occurrence of an intussusception. The resection, performed by Dr. Stephens, of the caecum and right half of the colon, together with the glandular mass, furnished the pathological museum with the specimen of which Figure XXXV is a photograph.

The few days succeeding that of the operation were very critical for the patient; but he gradually rallied, and on December 14 was sufficiently recovered to be transferred to the Royal Melbourne Hospital to receive irradiation therapy. Six weeks later he was readmitted to the Children's Hospital, having lost much ground, suffering great abdominal pain, and displaying to physical examination a large irregularly shaped mass, which occupied the greater part of the abdomen. On January 29, 1939, the boy's parents expressed a wish to take him home, where he died a few days later. This record therefore lacks the autopsy findings.

In the examination of Figure XXXV the vermiform appendix serves as a useful landmark from which bearings may be taken. The caecum has been laid open and the *caput caeci* everted so that the corrugated mucous membrane shows in the photograph. Projecting into the lumen is a spheroidal shaped sessile tumour, measuring five

centimetres (two inches) in diameter. Metastatic deposit in the retrocolic glands accounts for the upper tumour, the colon having been rotated before the photograph was taken, in order that the glandular deposit might be brought into view.

The macroscopic character of the tumour, which grew on a wide base from the posterior wall of the caecum and occupied almost the whole of the lumen of the *caput caeci*, was that of a firm fleshy growth with a rounded irregular surface; on section it was pallid and homogeneous in appearance, with no foci of hæmorrhage or recognizable degenerative change.

In reporting upon the histological features of this neoplasm I felt quite confident in describing them as those of a lymphosarcoma. From the microscopic structure of the tumour, as illustrated in Figures XXXVI and XXXVII, it will be seen that the component cells are small round cells, closely resembling the lymphocytes of the circulating blood. For the microscopist the distinction between the small round-celled sarcoma and lymphosarcoma is often an exceedingly close question; but a well-defined reticulated matrix, when present, is a point of histological evidence that should influence the decision towards lymphosarcoma. A prominent reticulum was a feature of the sections of this tumour, as shown in the photomicrograph (Figure XXXVII). In round-celled sarcoma of connective tissue origin such intercellular matrix is reduced to the merest trace.

The presence of the large lymphadenoid metastases made for a strong presumption of lymphosarcoma, and it was impossible to be quite insensible of this in making the histological diagnosis of lymphosarcoma as against small round-celled sarcoma. Spread by lymphatic paths is highly characteristic of lymphosarcoma, but is very unusual with other types of sarcoma; although the late E. H. Kettle<sup>60</sup> maintained with respect to sarcoma in general that invasion of lymphatic glands occurred quite frequently in the dissemination of these tumours, the lymphatic spread being frequently obscured by the more obvious vascular sowing.

R. A. Willis<sup>61</sup> states that the only types of sarcoma which metastasize to lymph glands are those of lymphoid tissue itself and rhabdomyosarcoma. Sarcoma of lymphoid tissue include the lymphosarcoma and the reticulum-sarcoma or endothelioma. All three types occur uncommonly. Lymph-nodal deposits from other sarcoma are so rare as to be "pathological curiosities". A very recent communication on this subject is that of S. Warren and R. W. Meyer,<sup>62</sup> who indicate that the proportion of cases in which sarcoma, other than lymphosarcoma, metastasize to lymph glands, though variously estimated, is generally believed to be small. Of 237 cases observed by these authors, a series from which lymphosarcoma, sarcoma derived from the endometrial stroma, and melanotic sarcoma were excluded, 17 (or 7%) were proved to have induced metastases in lymph glands. It follows from this finding that the counsel of perfection in operations for the radical removal of sarcoma is to dissect the neighbouring lymph glands when possible.

Lymphosarcoma occur but seldom. The pathological department of a hospital for children should provide a maximum of opportunity for observation of these tumours, but I have seen very few. I have reason to believe that in my early days at the Children's Hospital I misrecorded one or two examples of neuroblastoma as retroperitoneal lymphosarcoma, and not very long ago I was very hard pressed in the interpretation of a section of a cervical gland as between lymphosarcoma and acute lymphoblastic leuchæmia, subsequent events proving that the latter was the correct diagnosis. Derived as they are from lymphoid tissue, lymphosarcoma might be expected to arise in a variety of situations; but three locations cover the majority of sites of origin of these tumours: (i) the lymphoid tissue of the alimentary canal, and particularly that of the caecum; (ii) the anterior part of the mediastinum; and (iii) the tonsils and cervical glands.

As will be shown later, the mode of growth of the intestinal lymphosarcoma illustrated in Figure XXXV is exceptional; it is not usual for such tumours to arise from one side of the gut, the tendency being for them to

permeate the wall of the bowel round the whole circumference. Further, only a minority of such growths obstruct the lumen of the bowel in the manner shown in Figure XXXV.

My autopsy notes of the child who provided the specimen to which I have already referred as one of the oldest in the museum, are dated February 1, 1915, and include a summary of the clinical notes. These enable me to state that the patient, W.G., a boy, aged five years, was brought to the Children's Hospital on account of anaemia and debility of a degree which occasioned his parents much anxiety. The child's general nutrition was not obviously impaired, but to speak in apparent paradox, he was definitely, though vaguely, ill. Physical examination disclosed the presence of a firm ovoid mass in the lower portion of the abdomen on the right side. The existence of such a mass, considered in conjunction with the child's general aspect, prompted the eminently reasonable clinical diagnosis of tuberculosis of the caecum in the hyperplastic and tumefied form which it commonly assumes in this situation.

An exploratory laparotomy was performed by the late Dr. F. Hobill Cole and a biopsy specimen secured; on examination of a microscopic section of this I reported the presence of a lymphosarcoma. Resection of the caecum and ascending colon was successfully undertaken, but post-operative bronchopneumonia determined the boy's death a week later. The tumour was a fleshy growth involving the whole of the caecum and the proximal portion of the ascending colon. Sarcomatous newgrowth had infiltrated all the coats of the bowel except the peritoneal covering. There was some shallow ulceration on the mucous surface, but the tumour showed no tendency to fungate and project into the lumen of the gut. Neoplastic growth had proceeded along and around the wall of the caecum; so far from reducing the lumen, its presence appeared to have had the reverse effect and to have led to a measure of dilatation. The report of the autopsy states that no sarcomatous invasion of the mesenteric or retroperitoneal lumbar glands was evident macroscopically, nor could such metastasis be established by subsequent microscopic examination. No secondary deposits were detected elsewhere, in viscera, such as the lungs, liver, spleen and kidneys.

This malignant tumour of the caecum has languished in the pathological museum at the Children's Hospital for twenty-three years, unhonoured and unsung. Its presence, I venture to say, known to no one but myself. It is fitting that it should now emerge from its long retirement and be paired for discussion with the more recent example of its kind which has come to join it. For purposes of this communication Mr. H. Weir recently prepared microscopic sections of the 1915 tumour in order that I might revise and perhaps reconsider the histology. I can see no reason, however, to regard this specimen as other than a malignant tumour that has arisen in lymphoid tissue. A photomicrograph is reproduced in Figure XXXVII.

At this point it would perhaps be advantageous to extend the scope of the discussion to embrace the general question of sarcoma of the intestine. Text-books treat this subject with unsatisfying brevity; but informative articles are to be found in current and older literature. Of the earlier accounts of the subject perhaps the best-known articles are those of Libman<sup>(4)</sup> (1900 and 1905), and that of Jopson and White<sup>(5)</sup> (1901). Libman's papers dealt with sarcoma of the small intestine, that of Jopson and White with sarcoma of the large intestine; but none of these contributions was restricted to an examination of the condition as it occurred in children.

Libman reported five cases of sarcoma of the small intestine as observed at the Mount Sinai Hospital in the two years immediately preceding the publication of his paper (1900), and in his two papers reviewed altogether 59 examples of sarcoma of the small bowel. He found the lymphosarcomata to constitute the largest group, and described such tumours as arising in the submucous lymphatic tissue and exhibiting a tendency to grow longitudinally. The musculature was infiltrated and paralysed at an early stage, as the result of which the bowel

frequently displayed dilatation from retention of faeces. Until a very late stage the serous coat of the bowel escaped implication in the malignant infiltration. Libman commented upon the dilatation of the intestine as a peculiar though not a constant feature of intestinal lymphosarcomata. The growths were prone to be multiple, and diagnosis from tuberculous peritonitis and *tubercles mesenterica* might be very difficult.

Jopson and White, in reporting the clinical and pathological details of a sarcoma of the ascending colon which occurred in a boy aged four years, could find no more than 22 case records of sarcoma of the large intestine in the literature to 1901. Of the 22, no less than 15 were located in the caecum or ascending colon. Ten were recorded as round-celled sarcomata and nine as lymphosarcomata; but the differentiation between these two types must often have been influenced greatly by the predilections of individual pathologists. At all events, 19 of a total of 22 sarcomata of the large bowel were composed of cells of a "lymphoid" character. Most commonly the whole circumference of the affected segment of bowel was involved in the series of large bowel sarcomata reviewed by Jopson and White; but in approximately one-fifth of the cases the tumour was situated on one side of the gut, as it was in the case of the boy L.W., whose clinical features I have outlined and the specimen from whom is illustrated in Figure XXXV. In one instance only did the neoplasm result in an annular stricture such as is so commonly produced by carcinoma of the colon; on the contrary, the tendency was towards dilatation of the bowel, as noted by Libman. In the particular child who came under the observation of Jopson and White, the dilatation of the bowel induced by the presence of a sarcoma of the ascending colon was described by the authors as aneurysmal—a sacculatation contributed to by stretching of the infiltrated wall and necrotic change, with consequent breaking down of the substance of the tumour.

Australian observations on the frequency (or infrequency) of occurrence of sarcoma of the intestine have been supplied by E. M. Fisher,<sup>(6)</sup> who found that in the fifteen years preceding 1925, at the Royal Prince Alfred Hospital, Sydney, five examples of sarcoma of the intestine occurred in 265 instances of malignant disease of the large and small intestine, excluding the rectum.

After I had consulted these older papers on the subject of sarcoma of the intestine, Dr. Paul Jones kindly brought to my notice a very recent and admirable study of sarcoma of the intestine, as it has been observed in children.

A. Simpson-Smith,<sup>(7)</sup> in October, 1933, reported two instances of intestinal sarcoma which had arisen in his own practice, and contributed an exhaustive and valuable survey of the world literature on this subject dating from the year 1852. He was thus enabled to collect and analyse 106 cases of sarcoma of the intestine in children. It is of interest to note that the records of the Hospital for Sick Children, London, showed six cases of sarcoma of the intestine during the thirty-eight years since 1900.

Simpson-Smith's analysis, the data for which could not have been assembled without much painstaking bibliographical research, shows, *inter alia*, an almost 3:1 preponderance of sarcoma of the intestine in children in the male sex, the very frequent presence of a palpable abdominal tumour (this clinical feature being present in no less than 67 of 76 patients in whose case records it was mentioned), and what the author expresses as a 24% expectation of intussusception. Of the 106 intestinal sarcomata in children, 70 arose in the small intestine, and more than half of these (41) in the ileum. Among the 36 examples of sarcoma affecting the large intestine, no less than 23 were situated in the caecum, appendix or ascending colon. Simpson-Smith draws attention to the concentration in the ileo-caecal region. Obstruction of the lumen of the gut, in a manner such as is shown in Figure XXXV, occurred in only eight instances among 42 in which information was given on this point.

In an examination of the distribution of secondary deposits Simpson-Smith found a high incidence of metastases in the mesenteric and retroperitoneal lumbar



glands. In more than one-third of the cases reviewed the lymphatic gland groups indicated were recorded as being the sites of secondary malignant invasion. In 11 of the 106 case records examined it was stated that there were no secondary deposits; it will have been noted that no metastases were found at the autopsy on the second of the two children whom I have presented as subjects of intestinal sarcoma. Many of the records studied by Simpson-Smith showed that dissemination in sarcoma of the intestine might extend far beyond the abdominal glands and in its hemic phase the metastatic potentialities of sarcoma of the intestine are comparable with those of sarcoma in general.

The tendency of tumours of the small intestine, whether innocent or malignant, to provoke an acute intussusception is a well-established observation, and, as has been already stated, Simpson-Smith, in his study of sarcoma of the intestine affecting children, deduced a "24% expectation of intussusception". Only a few weeks ago I performed an autopsy on a baby who did not survive an entero-enteric intussusception precipitated by an inverted Meckel's diverticulum. In August, 1938, Dr. J. G. Whitaker found a small tumour at the apex of an entero-enteric intussusception in a little boy. He excised the tumour, which on histological examination I found to be of the nature of a fibromyoma. The early occurrence of an acute intussusception in all cases of sarcoma of the intestine would be a complication not altogether to be deplored, for by this means the tumours would be unmasked at an earlier stage than that at which they become evident in their normal course. Simpson-Smith's observations upon this point are interesting. In ten cases the growth was already palpable and had therefore reached a menacing stage before the intussusception occurred; in only nine cases (8.5%) could it be said that the invagination had brought the malignant disease under notice at an earlier date than it would otherwise have been detected.

Other notable papers relating to sarcoma of the intestine as it occurs in both adults and children are those of S. Graves<sup>10</sup> and of Ullman and Abeshouse.<sup>11</sup>

Graves reported three previously unrecorded cases and searched the literature, from which he collected 246 reports of "lymphoblastoma" of the intestine. Graves complained, with reason, that his examination of the literature was rendered unnecessarily difficult by the loose terminology and confused nomenclature which he encountered in his attempt to ascertain the precise histological character of the growths. In his case reports he employed the term "lymphoblastoma", which he defined as "a tumour of mesenchymal origin of which the cells tend to differentiate into lymphocytes; that is, into cells of the lymphocyte series". Under the term "lymphoblastoma" he included tumours designated in the literature as "lymphocytoma", "lymphoma", "lymphosarcoma", and many examples of "so-called round-celled sarcoma". Graves, after studying a much larger number of case records than were available to Jopson and White, agreed with their statements as to the tendency of sarcoma of the intestine to induce dilatation of the bowel rather than stenosis, and the exceptional occurrence of obstruction of the intestine from the projection of growth into the lumen.

The article by Ullman and Abeshouse embodied a detailed case report and supplemented Graves's series of 249 with 126, bringing the total of recorded cases to 375 in June, 1932. Ullman and Abeshouse treated the subject exhaustively, discussing it from the statistical, clinical, pathological and operative aspects. To this paper, as to that of Graves, is appended an admirable bibliography.

In the number of *The British Journal of Surgery* issued as recently as January, 1939, is an account by D. Lincoln Lewis<sup>12</sup> of two cases of sarcoma of the small intestine, one a leiomyosarcoma of the ileum, the other a lymphosarcoma of the small intestine. Lewis quotes Brink and Laing<sup>13</sup> as authorities for the statement that 250 sarcomata of the small intestine have been recorded, and of these, 6% to 8% have been myogenous. The older writers on the subject had noted the rarity of the accident of perforation, and this observation is confirmed by Lewis's finding that perforation of the gut occasioned by the

presence of a lymphosarcoma has been reported only six times in a literature which embraces nearly 400 of these tumours.

No individual, clinician or pathologist, can expect to see many examples of a lesion such as intestinal sarcoma; hence the duty devolving upon those who meet the isolated instances that do occur to give some account of them. This I have endeavoured to do, feeling that the clinical and pathological details relating to these two specimens merit the notice of a much wider public than they are ever likely to reach from the index cards of a pathological museum.

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#### Reviews.

##### CHRONIC CONDITIONS OF THE ABDOMEN.

IN view of the well-deserved success of Zachary Cope's monographs on "the acute abdomen", it is not surprising to find an attempt to render similar service in the elucidation of the problems presented by chronic abdominal conditions. While the difficulties inherent in the extent of the second problem may be allowed to outweigh those presented by the urgency of the first, it must be held that Dr. Marshall has not achieved the degree of success attained by his model. The few typographical errors are scarcely worthy of mention, though omission of words from the text is more annoying than errors in spelling. More deserving of criticism is the inconsistency of headings; for example: (1) "Organic Diseases"; and (2) "Other Functional Diseases"; and of subdivisions, "Duodenal Ileus" occurring twice, once under organic gastric disorders and again under extra-gastric disorders. But there are graver inconsistencies than these. The purist who inveighs against the etymological abomination of "chronic appendix" and shortly afterwards approaches pedantry by calling threadworms oxyuriasis, is guilty of such offences as "pulmonary tubercle", "diet and gum blood". Further, what is the meaning of such phrases as "puerile pathology" and "distensile pain"? Especially in the earlier pages an air of familiarity appears which is out of place in a scientific treatise. In addition the author has an irritating taste for quotation marks, italics, parentheses, digressions, footnotes and marks of exclamation. Space will only permit the quotation of one sentence as an unpleasant example of style:

<sup>1</sup> "Chronic Diseases of the Abdomen: A Diagnostic System", by C. J. Marshall, M.S., M.D., F.R.C.S.; 1938. London: Chapman and Hall Limited. Royal 8vo, pp. 265, with illustrations. Price: 25s. net.



The minatory attitude has been assumed more frequently with regard to the dire consequences of the condition than in connection with any other common aberration of conduct, but it may be as strongly doubted whether it is even remotely so much a producer of disease as it may equally certainly be believed to be the most fertile producer of abdominal symptoms.

Turning from manner to matter, the question arises as to the audience for which the book is intended. A considerable proportion of space is devoted to standard methods of investigation or to the somewhat tabular arrangement of classical differential diagnoses, such as those of jaundice, splenomegaly and anorexia. These are often reduced to thumb-nail sketches without benefit and may be found discussed adequately in accepted text-books of clinical methods. Despite its title, the remainder of the book is more comprehensive than systematic. However inadequately brief in itself, the discussion of "railway spine" seems unnecessary. On the other hand, after an introduction which considers in italics the existence of "many pathological entities . . . which have so far escaped elucidation" it is curious to note the absence of any reference to Crohn's regional ileitis. Almost without exception the author's views are sound, even admirably so, but there is singularly little that is new. If the question is asked: "Has the student, provided with standard text-books on clinical methods, medicine and surgery, or the practitioner who has added to his undergraduate library an index of differential diagnosis, anything to gain from this volume?" the answer must be "No".

#### MINOR OPERATIVE PROCEDURES.

"MINOR MEDICAL OPERATIONS", by Kenneth Harris and Edith Harris, purports to instruct the senior medical student and the recently qualified practitioner in the fine art of carrying out on the patient all those practical procedures which come chiefly within the domain of the physician as opposed to that of the surgeon.<sup>1</sup> This is done with clarity and conciseness. The physician of today is called upon to inflict upon his patients a multitude of fine assaults, and, having for his aid a local anæsthetic only, must perforce develop a technique of accuracy and gentleness if his patient is to come through with the least amount of physical and mental suffering.

The subject matter of this book is divided into two parts. The first part, after a preliminary discussion on the preparation of patient and apparatus in general and the technique of injections of various kinds, proceeds under the heading of the body systems to a description of those operations involved in the diagnosis and treatment of diseases of the particular system. Under the heading of "Respiratory System" are included, amongst other sections, accounts of bronchography by lipiodol, explorations and paracentesis of the chest, and the induction of artificial pneumothorax. Within the limitation of a small book the last-named procedure is described very succinctly.

In the section of the cardio-vascular system, blood grouping and blood transfusion and paracentesis of the pericardium and peritoneum are efficiently dealt with. The alimentary system group involves nasal, oesophageal and stomach intubation, the technique of test meal procedure and the various phases of rectal intubation.

In appropriate sections the commoner medical kidney function tests are described; and the technique of lumbar cisternal puncture, pressure measurement of the cerebro-spinal fluid and lipiodol injection into the subarachnoid are adequately set forth.

A further chapter deals with the features of saline administration through the usual portals, and the last

chapter of Part I with skin tests including those of protein sensitivity, of Schick, Dick, Schultz-Charlton and Mantoux.

Part II opens with the general care of the patient and closes with a description of some sick-room procedures.

The book, though ostensibly written for the junior practitioner, can be recommended to physicians and surgeons alike as an accurate and concise description of most of the minor operative procedures which the practitioner will be called upon to carry out.

#### THE PROBLEM OF POPULATION.

For those who are interested in a concise yet comprehensive discussion of the factors involved in the problems of population, one can recommend with every confidence "Population: To-day's Question".<sup>2</sup>

The author has successfully covered a very wide and complicated subject, and whilst clearly explaining statistical details which are essential to a proper understanding of the problem, he holds the reader's interest throughout by a lucid style and numerous interesting references and annotations.

His defence of Malthus explains precisely the latter's contribution to knowledge and what he actually said. He points out that the epithet "Malthusian" has been curiously applied to (contraceptive) practices which Malthus not only never advocated, but regarded "with the most marked disapprobation".

The great increase of population in England in the eighteenth century is shown to have been due not to an increased birth-rate but to a diminished death-rate, whilst the present day problem consists essentially in the fact that the birth-rate has been falling for the past sixty years. The implications of the tendency to family limitation are fully discussed; and the inevitable result of this tendency in a decline of population, slow at first but becoming rapid in subsequent years, is pointed out. The result for European countries and particularly for the British Empire and the Dominions is shown as various social and economic consequences which will be far-reaching unless some solution can be found or readjustments can be made.

The book as a whole is an admirable presentation of a many-sided and important problem, which is discussed from all angles in an arresting, clear and logical manner. All references are annotated in footnotes to text and there is also an index.

#### Notes on Books, Current Journals and New Appliances.

##### TREATMENT IN GENERAL PRACTICE.

SOME little time ago we drew attention in these columns to two volumes containing articles on treatment in general practice which had been reprinted from *The British Medical Journal*. A second edition has now appeared.<sup>3</sup> The articles have been revised by the authors and they have been brought up to date by inclusion of reference to the use of sulphamillamide compounds in the treatment of streptococcal and other infections. These books cannot fail to be of the greatest use to medical practitioners. Even those who have read the articles from week to week as they appeared in *The British Medical Journal* may like to have them under one cover, where they may be the more readily consulted.

<sup>1</sup> "Population: Today's Question", by G. F. McCleary; 1938. London: George Allen and Unwin Limited. Crown 8vo, pp. 222. Price: 6s. net.

<sup>2</sup> "Treatment in General Practice (Articles Republished from The British Medical Journal): The Management of Some Major Medical Disorders: Volumes I and II; Second Edition; 1938. London: H. K. Lewis and Company Limited. Demy 8vo, pp. 264 and 447. Price: Volume I, 8s. 6d. net; Volume II, 10s. 6d. net.

<sup>3</sup> "Minor Medical Operations for Senior Medical Students and Recently Qualified Practitioners", by K. Harris, M.A., M.D., F.R.C.P., and E. Harris, M.B., B.S., D.P.H.; 1938. London: H. K. Lewis and Company Limited. Crown 8vo, pp. 310, with 41 illustrations. Price: 7s. 6d. net.

## The Medical Journal of Australia

SATURDAY, APRIL 22, 1939.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.

### HOLIDAYS WITH PAY.

MEDICINE no longer confines itself to the treatment of disease. Preventive medicine has largely overshadowed what is known as curative medicine. This is not due solely to the increasing activities of public health departments; it is due to the discovery during recent years of the cause of many previously obscure pathological conditions. Everyone will agree that the community would be foolish if, knowing the cause of a disease, it sat back in complacent satisfaction at the prowess of its scientists and waited until its citizens were attacked before it sought to apply a remedy. Unhappily this is the attitude adopted in some places; but an enlightened community attacks the disease by trying to prevent it, and makes the attack through its medical practitioners. Attack on disease consists not only in an attempt to eliminate the causative agent, but in an effort to make the individual members of the community so robust, so strong and healthy, that they will be able to withstand the onslaught of any noxious agent. Medical practitioners must therefore concern themselves with anything and everything which bears directly or indirectly on the health and happiness of the individual. A moment's thought will show that this covers a wide range. Such apparently remote

matters as wages, housing, recreation and the employment of leisure come within its purview. The spheres of economics and politics must be entered, and as time goes on this forced entry will become more and more necessary. In other words, medicine must concern itself with the bodily, mental and spiritual welfare of man.

Work is necessary to man's well-being. Paul of Tarsus wrote: "Let every man prove his own work, and then shall he have rejoicing in himself alone, and not in another. For every man shall bear his own burden." In another place he declared that "if any would not work, neither should he eat". There is dignity in work, even though Adam was told that in the sweat of his face he should eat bread. Even those who inherit vast estates are poor creatures unless they look on their wealth as a trust to be used for the good of their fellow men. But rich and poor alike cannot work month after month and year after year without growing stale—the mind becomes dull and the body weary, efficiency becomes lessened and health impaired. The man who is his own master as a rule finds little difficulty in taking an annual holiday; and the business firm is wise that makes its employees spend a week or two every year away from the scene of their labours that they may recreate themselves. But not all industrial concerns are either far-sighted or generous, and arbitration courts have been compelled in certain spheres to make provision for the granting of annual leave. The average worker drawing the award wage, or a little more than the award wage, will find it hard to make both ends meet if his wages are stopped while he is on leave; he will in these circumstances not get the full benefit of his holiday, and incidentally his employer will in the long run be the loser as well as himself. This matter has received attention in England. A special committee was set up by Parliament in 1937 "to investigate the extent to which holidays with pay are given to employed workpeople and the possibility of extending the provision of such holidays by statutory enactment or otherwise; and to make recommendations". The report was presented to Parliament by the Minister of Labour in April, 1938, and has been published by His Majesty's



**Stationery Office.** The general recommendation was as follows:

An annual holiday with pay should be established, without undue delay, as part of the terms of the contract of employment of all employees as defined . . . This holiday should consist of at least as many days as are in the working week, and these days should as far as practicable be taken consecutively. The period of holiday should be arranged to take place between the beginning of summer time and the beginning of October in each year. Where, however, it is not practicable to do so, the holiday should take place at such other period of the year as may be decided.

The chairman of the committee which made this report, Lord Amulree, has stated that to fulfil its purpose a holiday should be a period in which the worker has not only leisure, but also the means to go away or to do interesting and healthful things. With this all sensible people will agree.

In Australia the Commonwealth Court of Conciliation and Arbitration has granted annual leave with pay to employees in the printing industry; in many other industries this has not been done. In some of the larger industries and services in which public holidays could not be enjoyed because of the nature of the industry or because of shift work, annual leave has for many years been granted. Conditions vary in the different States of the Commonwealth, and States are a law unto themselves (they have their own jurisdictions); but it is high time that some steps were taken to provide annual leave with pay for employees in all industrial undertakings. It has been estimated that more than 50% of male and female workers in secondary industries and factory employment are not, by award, entitled to annual leave with pay. The position in Victoria and South Australia is less favourable to the employee than in other States. In order to show how far employers will go to avoid paying their employees, it may be pointed out that some firms have avoided payment of their employees for public holidays at Christmas time by dismissing them all before Christmas and telling them that they may apply for reengagement after the new year. This despicable action was made possible by the defective drawing up of the holiday clauses of several awards; the evil is not very great at present, for the defects have been remedied in many of the clauses. Payment for public holidays is, by

the way, entirely different from payment for annual leave. It is possibly true that the brain worker in any industry needs more relaxation than one who works purely in a mechanical fashion—and we must remember that so-called manual work often calls for mental effort and that non-manual work may be purely mechanical. If the Australian worker is to be healthy in the widest sense, he must have the opportunity to recreate himself at regular intervals of time and under suitable conditions.

## Current Comment.

### NUTRITION AMONG THE NATIONS.

ANOTHER report, dated November 30, 1938, entitled "Survey of National Nutrition Policies", has been issued by the League of Nations.<sup>1</sup> At a meeting of national nutrition committees held at Geneva in October last, sixteen countries were represented. This report is based on reports furnished by governments to that meeting and on discussions which they aroused. Though the document is not intended to be a survey of the whole field of governmental action for the improvement of nutrition, it is of interest on account of its information on conditions in different countries, from which useful lessons may be learned.

In 1936 the Mixed Committee of the League on Nutrition recommended that the governments should set up special bodies, having as their objective the coordination of nutrition work. Since that time national nutrition committees have been organized in twenty-one countries, several being outside Europe. There are twenty-six committees in the British Empire, and there is one in the Netherlands East Indies. The United States of America also have a Technical Committee on Food and Nutrition. Some of the committees have been granted no credits at all and have been dependent on private organizations for monetary assistance. Others have been generously supported, directly or indirectly, by their governments. The Commonwealth of Australia is quoted as an outstanding example, for the Commonwealth Government granted £5,000 a year for three years to the Advisory Council on Nutrition. The work of these national nutrition committees falls roughly into two parts. The first is "to collect information regarding nutrition problems, to classify it and to determine its limitations and defects". Having obtained this information, they are obviously in a position to make plans for the filling in of the gaps and for the gathering of further information. The second function of these committees is to examine the results of their research with a view to the application of remedial

<sup>1</sup>"League of Nations Publications. Survey of National Nutrition Policies, 1937-1938". 1938. Geneva: League of Nations Publications Department: Australia: H. A. Goddard. Royal 8vo, pp. 120. Price: 2s. 6d. net.



measures. One of the most interesting chapters in the review is that dealing with the results of surveys in different countries. Some of the more important findings will be recorded in this place, but it is necessary to insist that the account is far from being a complete summary of the state of affairs in any country. To begin with Australia, the report refers to the work of Dr. Clements, now Director of the Institute of Anatomy at Canberra; some of his investigations have been published in this journal. It is disconcerting and somewhat humiliating to read that of 3,384 school and pre-school children examined in four inland areas, 607 or 17.9% showed evidence of unsatisfactory nutrition. That no scurvy was found in spite of a low intake of fresh fruit and vegetables is fortunate rather than a matter for congratulation; and Australians will surely hang their heads in shame to see the announcement to the world that rickets was found in 6% to 11% and nutritional anemia in 4% to 6% of the children examined. In 36% of 192 Sydney families comprising 422 children the state of nutrition was unsatisfactory. To illustrate the importance of sociological factors, the results of investigation at Mount Isa, Queensland, are quoted. In the town school the figures for nutritional anemia, active rickets and chronic infections were 4%, 17% and 4% respectively; in the mine school, the children of which came from a population where wages were good and social environment was better than that of the town school children, the figures were 3.4%, 10.3% and 1.7%. A rash or unthinking person who reads these statements may draw wrong conclusions. Obviously if wages are insufficient people cannot buy sufficient food of any sort; but the laity needs to be reminded over and over again that it is not a sufficiency of food that is necessary, but a sufficiency of the right kind of food. The child of a rich man may be just as undernourished as the child of his poorer brother. But let us leave Australia and turn to other countries. In the United States of America it was found that 25% to 40% of the income of 4,000 people investigated in 43 industrial centres was spent on food. None of these people had been on relief and all had been in steady employment. From four regions in which the most extensive investigations were made, from 40% to 60% of the diets of white people were found to be in need of improvement. Among negro families in the south this figure was 60%. In Bulgaria bread is the staple food; it provides 79% of the total energy value of the diet; sometimes the diet consists entirely of bread. It is stated that the ingredients of the bread are often of poor quality and "even unfit for human consumption". No report has yet been presented from Canada. The analysis of the figures from France is as yet incomplete, but it is stated that a survey was carried out by the *Assemblée française de Médecine générale*. The general conclusion of this survey was that on the whole nutrition in France is adequate, except in the slums, and that inadequate diet may be found among the richer as well as among the poorer classes. This is

apparently merely an impression and cannot probably be accepted as authoritative. In Hungary it has been found that if exports are to remain unchanged and if requirements are to be fully met, the present production of milk will need to be increased by 120%, that the production of eggs will need to be raised by 470%, and of fresh vegetables by 20%. "The total production of fruits appears to cover total annual requirements, but it is likely that consumption is very unevenly distributed both regionally and seasonally. It appears that the total energy and protein requirements of the population are covered by production. But the consumption of animal protein is too low." In Norway 53 families out of 301 investigated did not use any whole milk at all during the four weeks of the investigation. Some of these families were on relief, but we are not told what the number was. The situation in regard to these 53 families is important, for we are told in the chapter dealing with the economic aspect of the problem that Norway dumps a great deal of its butter abroad. Norway spends about a million kroner each year that foreign buyers may obtain cheap butter and its own people are consuming insufficient quantities of this most important foodstuff. Truly the dumping of surplus farm produce on foreign markets at uneconomic prices is a "disadvantage"—a much stronger word might be used. Incidentally the dumping of large supplies of fish and vegetables of a certain kind in Australian cities to keep the price up for the advantage of "middle men" is something more than a "disadvantage". In Yugoslavia the inhabitants of some villages "observe practically all the Orthodox fasts, which may amount to as many as 206 days in the year". In this statement only the more striking features of the findings have been mentioned. The chapter devoted to them is necessarily sketchy, for the investigations can give nothing but a general idea of conditions in the countries concerned. Other countries which are at present in the public eye were not, of course, included in the activities of the League of Nations. In the chapter on the economic aspect of the question it is stated that the problem is largely an economic one and that all surveys so far completed have shown the importance of the economic factor in determining the diet of the individual families—"families in the lower income group are unable to purchase sufficient food of the right kind". Bound up with this is the question of distribution, together with that of internal dumping. As has already been stated, money is not the only need. Education and publicity are sorely needed. "It is surprisingly common to find relatively well-to-do sections of the population living on poor diets when, for an expenditure within their means, they could, by the wise choice of foodstuffs, obtain all the constituents of a good diet in sufficient quantities." This report shows what has been and is being done in some countries to arouse interest in nutrition. We do not propose to describe the methods adopted, but we would urge all those interested in nutrition to study this report.

## Abstracts from Current Medical Literature.

### BACTERIOLOGY AND IMMUNOLOGY.

#### Nasally Instilled Vaccinia Virus.

JOSEPH M. YOFFEY AND EUGENE R. SULLIVAN (*The Journal of Experimental Medicine*, January, 1939) followed the dissemination of nasally instilled vaccinia virus through the lymphatic pathway from the nose and pharynx. Stabilized virus was inoculated into the anterior nares of monkeys, rabbits and a cat under "Nembutal" anaesthesia. In one group lymph was obtained from the cervical lymph duct over varying periods up to nine hours after the introduction of virus, in another group over periods up to seven days. Thoracic duct lymph, blood and nasal washings were also obtained and tested for the presence of virus. No evidence of the presence of virus in lymph could be obtained within nine hours of instillation, but it was present up to seven days later in the animals tested, so that a continuous stream of virus was entering the circulation from the lymph for the whole of that period. The virus obtained after the lymph had traversed a lymph gland showed slightly less concentration than that from the cervical duct. It was also found that if a sample of lymph previously tested and found to contain virus was centrifuged, and sediment and supernatant fluid were tested separately, a positive result was obtained only from the sediment, which consisted of 100% lymphocytes. The authors suggest that this fixation of virus by lymphocytes might protect it from the action of neutralising bodies in the serum, and that the power of the lymphocyte to migrate might be the agent by which the virus was transmitted. The presence of the lymphocyte in the lesion of virus disease in general might be the cause rather than the result.

#### Laboratory Diagnosis of Diphtheria.

H. R. SHONE, J. R. TUCKER AND H. D. WRIGHT (*The Journal of Pathology and Bacteriology*, January, 1939) investigated 1,684 patients admitted to hospital with a diagnosis of diphtheria, and found that in 36% of cases the diagnosis could not be proved bacteriologically. The cultures were inoculated on Löffler's medium and tellurite blood agar plates, and examined microscopically with a view to the making of a primary diagnosis and verified later. The microscopic diagnosis was correct at the first examination in 93.3%, the second and third swabs showed a further proportion of positives, and 2.6% of conditions were accepted as diphtheria although bacilli could not be found. In some of these cases

the patients were in the late stages of post-diphtheritic paralysis. The error of the method was thought not to be greater than 1.5%. In 6% of cases bacilli proved non-virulent on later examination. Nasal swabs were examined as a routine in the first 839 cases, but were found in the majority of cases to have little advantage; in the later part of the work, therefore, nasal swabs were taken for diagnostic purposes only from patients with laryngeal infection or those with nasal discharge. When swabbings were made before the discharge of the patient from hospital, however, the nasal swabs were of the greatest importance. The authors thought that the combination of the method of Löffler slopes and tellurite plates gave the maximum efficiency in diagnosis. Of the conditions proved not to be diphtheria, those occurring in the later age periods were most frequently among the group in which diagnostic errors were made, and were often cases of streptococcal tonsillitis. The authors hold that the fatality rate is the only reliable indication of the severity of diphtheria in a community, as the notification of diphtheria so often precedes the proof of diagnosis.

#### Precipitinogens in Rheumatism.

ALVIN F. COBURN AND RUTH H. PAULI (*The Journal of Experimental Medicine*, January, 1939) have found a precipitinogen in the serum of patients prior to the onset of acute rheumatism. They have studied the three phases of this disease. Phase I is that of upper respiratory infection, Phase II is the latent symptom-free period, and Phase III that of acute rheumatism. They consider that Phase II is essential in the development of the disease, and have previously demonstrated a diminution of natural complement in the serum at this time. They therefore looked for the presence of an antigen antibody reaction in the serum taken from the patient during this time and in Phase III. Of seventeen patients in whom the cycle was observed from the beginning of a bacteriologically proved hemolytic streptococcal infection of the pharynx, all except one gave a reaction; the strongest reaction was obtained in a rapidly fatal case. The reaction occurred in all cases between samples of serum taken in Phases II and III, and was given between heterologous as well as homologous serum. A series of nineteen patients having a hemolytic streptococcus infection of the throat, not followed by the latent period and development of acute rheumatism, did not manifest the reaction, while three others did, and one of these later manifested symptoms. Rheumatic patients during a remission lost the reaction, while they regained it during a relapse. The serum was tested against stock streptococcus antigens and streptococcus antibody preparations, and no direct relationship could be shown. The authors suggest that as all streptococcus antigens are formed

slowly in the latent period, they may act upon the tissues and so produce a tissue antigen.

#### Refined Diphtheria Antitoxin.

A. T. GLENNY AND M. L. JONES (*The Journal of Pathology and Bacteriology*, November, 1938) have studied the absorption of refined diphtheria antitoxin as compared with the absorption of antitoxin prepared by the common method of ammonium sulphate precipitation. The antitoxin was purified by proteolytic enzymes according to the method devised by G. C. Pope. Pairs of guinea-pigs were given doses of refined and common antitoxin and then tested with multiples of doses of Schick toxin on the skin at fixed intervals of time after the injection of antitoxin; the results were read in two days. It was found that the pigs injected with refined antitoxin could tolerate larger doses of toxin over a longer period than those injected with common antitoxin. If 1,000 units of refined antitoxin were injected subcutaneously, the number of pigs failing to give reactions to the skin tests for 12 to 15 days was approximately double that of pigs injected with common antitoxin. If the refined antitoxin was injected intraperitoneally and the pigs were given a lethal dose of toxin, the pigs treated with refined antitoxin survived longer than the pigs injected with common antitoxin. The authors believe that the refined antitoxin has quicker penetration to the tissues than that prepared by the common method.

#### A Special Form of Erythrocyte.

A. M. BARNETT (*The Journal of Pathology and Bacteriology*, May, 1938) has described a special form of erythrocyte possessing increased resistance to hypotonic saline solution. The cells in stained films show a darkly stained periphery and centre, and a pale intermediate zone producing alternation of colour as in a target; he has therefore called them target cells. The cells were noted in cases of obstructive jaundice, in which resistance to hypotonic saline solution was a feature. The number of cells unhemolysed by 0.3% saline solution was estimated, and the percentage of target cells present in stained films from the sediment of that solution was estimated. It was found that when the figure of 2% for unhemolysed corpuscles was reached target corpuscles were always present, but below that figure they were almost entirely absent. In three cases in which splenectomy had been performed it was found that while target corpuscles were absent at the time of operation, they appeared and increased in numbers after operation. It was also noted in the cases of obstructive jaundice that the target cells and the resistance to hypotonic saline solution disappeared as the jaundice faded. Experiments were designed to determine whether the



target shape was acquired during fixation of the films, and this appeared to be so. Moist preparations of blood showed, however, that in the target cell blood there were many "bowl-shaped" cells which tended to adhere to the slide. Models of these cells were made in "Plasticene" and X ray pictures were taken, when it was found that they gave the target appearance. Calculations of the mean corpuscular volume in these cells gave a definitely low figure. The target cells were also found in severe hypochromic microcytic anemia and in steatorrhea. The mechanical theory of hemolysis is discussed, and the inference is made that the resistance of a corpuscle is determined by the magnitude of its surface as compared with its volume, and that the existence of the bowl-shaped corpuscle and its target form can be explained in this manner.

### HYGIENE.

#### The Epidemiology of *Trichinella Spiralis*.

WILLARD H. WRIGHT (*American Journal of Public Health*, February, 1939) has investigated the epidemiology of *Trichinella spiralis*. Three thousand diaphragms were collected without reference to clinical diagnosis in order to determine the extent of trichinosis in the United States of America. The basic series of 2,100 from the army and navy showed a trichina incidence of 16.8%. Other sources varied from 13.8% in persons killed by accident to 18.6% from hospitals where trichinosis had never been reported. A Jewish series showed the low incidence of 0.7%. Both microscopic and digestive-Baermann methods were employed. The majority showed infestations of less than 11 larvae per gramme, but 2.5% gave figures of 101 to 1,000 larvae per gramme, which suggests that 0.4% of the population suffer from infestations likely to cause clinical trichinosis. Statistical analysis does not suggest that any of the groupings—sex, colour, occupation, socio-economic *et cetera*—are significant. White females give rather low and war veterans high figures. Age may be a factor, but this is still unproven. The geographical incidence is heaviest along the North Atlantic and Pacific coasts, areas where feeding of uncooked garbage to swine is practised extensively. The area south and west of the Great Lakes comes next. The southern States show a much lower incidence. Southern swine, which roam the fields and woods for food, and swine fed on cooked garbage show low infestations (0.5%). Grain-fed swine, which also get scraps, have three times this infestation, and swine fed on uncooked garbage nine times (4.5%). Of swine eating slaughter-house offal, 10% are infested. Wright thinks that the part played

by the rat is of minor importance; the difference between swine fed on cooked and uncooked garbage suggests this. Methods of control include regulations for freezing for twenty days at 5° F., heating at 137° F. or smoking or curing of pork products usually consumed uncooked. Special restrictions should be placed on garbage feeding, and regulations should be issued for effective cooking and plant supervision. Municipalities need to set a good example, as 50% of cities use the hog-feeding method of garbage disposal.

#### Chronic Nicotine Poisoning.

R. H. WILSON, J. B. McNAUGHT AND F. DE EDO (*The Journal of Industrial Hygiene and Toxicology*, September, 1938) have been working in a laboratory in which for the past seven years studies in chronic toxicity of nicotine have been carried out. Chronic toxicity in general is defined and mechanisms of such condition are discussed. In the present work nicotine was incorporated in the normal basic food of albino rats. Body lengths and organ weights of animals fed with nicotine were compared with the normal and with those of animals affected by inanition and malnutrition. Autopsy procedure is described and protocols are included in a full discussion. The organs of rats which for 100 or 300 days had been fed nicotine as the sulphate, bentonite and tannate, were examined microscopically. It was found that the continued feeding of the nicotine-containing diets to the rats led to a slightly though definitely shorter body length than was possessed by animals treated comparably except for the nicotine. The weights of liver and spleen of the rats receiving nicotine were slightly though definitely greater than those of their controls. Weights of kidneys, adrenals, testes and heart did not differ from the control values. Histological evidence of damage to any of the organs studied in these feeding experiments was negligible.

#### Radiation as a Factor in Home Heating.

RUTH PARTRIDGE AND D. L. MacLEAN (*The Journal of Industrial Hygiene and Toxicology*, September, 1938) have endeavoured to determine the magnitude and importance of radiation in the heating of twelve representative domestic dwellings in or about Toronto during winter. Data are presented in regard to temperature, relative humidity, air movement and radiation, together with the corresponding values for the various indices used by workers in different countries. The amount of heat loss from clothed and unclothed subjects by radiation and convection with the ventilation conditions which apply in dwellings has been calculated by different methods. Observations were made in the living-room, kitchen and bedrooms of each dwelling—57 rooms in all. The average outdoor

temperature during this study was 30° F. In these rooms the air temperature ranged between 62° and 83° F., and the relative humidity between 12% and 54%. Air movement was 30 feet per minute in three rooms, and did not exceed 15 feet per minute in 50 of the rooms. The range of values for the mean radiant temperature was from 61° to 73° F. In the houses the amount of radiation as estimated by the difference between the globe thermometer and the air temperatures was small. The workers consider that with the usual type of dwelling, such as was used in this work, the radiant factor in heating is small. Of the total radiation, 8% or less was supplied by objects in the room other than walls *et cetera*. It is assumed that the conditions found in 70% of the houses represent comfort for the majority of the people. On this basis, air equivalent, British equivalent and operative temperatures between 65° and 74° F., effective temperatures between 63° and 69° F., and equivalent warmth temperatures between 62° and 70° F. may be considered comfortable for dwellings in the climate described. The values 20% to 44% found for relative humidity in the majority of the homes do not represent conditions of extreme dryness or moisture. The relative humidity did not exceed 54%, although four houses were equipped with humidifiers. Higher values are not practical, since large differences between inside and outside temperatures cause condensation on the windows or on the walls.

#### The Tensility of the Rat's Aorta.

JEAN F. HUME (*The American Journal of Hygiene*, January, 1939) has investigated the tensility of the rat's aorta as influenced by age, environmental temperature and certain toxic substances. The object of the study was to develop a measure of the ageing process based on the physical characters of the arteries, a corollary of the axiom "a man is as old as his arteries". Tensility (capacity of being stretched), not elasticity (tendency to return to the original form), was chosen as the character, and the animal selected was the white rat, which possesses a life span of three years. Immediately after death a ring of aorta one centimetre long was tested and carefully measured; the cross-section was estimated and mercury was added to the tensometer till rupture took place. In senile rats (600 days) the ultimate breaking point was about half that of young rats. A high environmental temperature (82° to 90° F.) decreased tensility to the senile level, though growth was normal. A low temperature (65° F.) showed normal resistance, though growth was retarded. Neither ingestion of lead nor exposure to alcohol vapour gave this senile reaction. Growth was unaffected in the lead series, but was much decreased in the alcoholized group.



## British Medical Association News.

### MEETING OF THE FEDERAL COUNCIL.

A MEETING of the Federal Council of the British Medical Association in Australia was held at the Medical Society Hall, Albert Street, East Melbourne, on March 14, 1939, SIR HENRY NEWLAND, the President, in the chair.

#### Representatives.

The following representatives of the Branches were present:

*New South Wales:* Dr. George Bell, O.B.E., Dr. W. F. Simmonds.

*Queensland:* Dr. D. Gifford Croll, C.B.E., Dr. T. A. Price.

*South Australia:* Sir Henry Newland, C.B.E., D.S.O., Dr. A. F. Stokes.

*Tasmania:* Dr. W. E. L. H. Crowther, D.S.O.

*Victoria:* Dr. F. L. Davies, Dr. H. C. Colville.

*Western Australia:* Dr. F. W. Carter, Dr. L. Hayward (as substitute for Dr. L. E. Le Souef).

Dr. W. E. L. H. Crowther acted as proxy for Dr. S. Gibson.

#### Minutes.

The minutes of the previous meeting of the Federal Council of December 12 and 13, 1938, which had been circulated among members, were taken as read and signed as correct.

#### Retirement of Dr. J. Newman Morris and Dr. D. D. Paton.

The President referred to the retirement from the Federal Council of Dr. J. Newman Morris and Dr. D. D. Paton. He said that Dr. J. Newman Morris had been a member of the Federal Committee from September 2, 1929, until 1933, when it became the Federal Council, and had served on the latter body since that date. He had been Vice-President of the Federal Council since August, 1933. Dr. Paton had become a member of the Federal Committee in February, 1925, and had served continuously since that time, first as a member of the Federal Committee and then as a member of the Federal Council. The President said that both Dr. Newman Morris and Dr. Paton had given valuable service. Their wise counsels and mature judgement would be missed. Dr. George Bell expressed his admiration for the work done for so many years by Dr. Newman Morris. A resolution in appreciation of the services of Dr. Newman Morris and Dr. D. D. Paton was carried.

#### Appointment of Office-Bearers.

The Secretary announced that two nominations had been received for the office of president: those of Sir Henry Newland and Dr. T. A. Price. A ballot was held and Sir Henry Newland was declared elected as President.

Only one nomination had been received for the position of Vice-President, that of Dr. George Bell. Dr. Bell was declared elected.

Only one nomination had been received for the office of honorary treasurer, that of Dr. George Bell. The Secretary said that he had obtained legal opinion and had found that there was no reason why a member of the Council should not serve both as vice-president and as honorary treasurer. Dr. George Bell was declared elected. The Secretary reported that the following notice of motion had been received from the Queensland Branch:

That it be a recommendation to the Federal Council that steps be taken for provision to be made for the election annually, by the Branch councils, of a president of the Federal Council.

A common letter had been sent to the Branches and replies had been received. The New South Wales Branch did not desire an alteration in the present arrangements. The Western Australian Branch was opposed to the

suggestion. The Victorian Branch disagreed with the suggestion. The South Australian Branch regarded the present method as satisfactory. The Tasmanian Branch expressed its approval of the present method. Dr. D. G. Croll, speaking as representative from Queensland, admitted that the motion was not in order, as the Federal Council was an incorporated body. The motion lapsed.

#### Finance.

The financial statement as at December 31, 1938, was presented. The statement included the Federal Council account and the Australasian Medical Congress (British Medical Association) fund account. The statement was received.

During discussion on the use of surplus congress funds, Dr. George Bell, who had been asked to report on the matter, stated that at no time had the objects of congress been defined, but that it had always been recognized that congress was a scientific meeting and that therefore the funds could be expended only in the promotion of the medical and allied sciences. A letter was read from the Australasian Medical Publishing Company, Limited, containing a proposal that the company should be reimbursed for its loss in connexion with the publication of papers read at the fifth session in Adelaide. After discussion it was decided that consideration of the matter should be postponed to a later meeting of the Federal Council, when the financial arrangements in connexion with the fifth session had been discussed with the executive committee. Another letter was received from the executive committee of the sixth session, to be held at Perth in 1940, that the sum of £100 should be paid to each of two visiting lecturers from overseas, in order to assist in the payment of their travelling expenses. The Federal Council agreed with the suggestion.

The annual contribution of the Branches for the expenses of the Federal Council was discussed. The Secretary reported that he had conveyed to the several Branches the resolution of the Federal Council in which it was stated that in view of the increased activities of the Council the yearly contribution should be a minimum of 10s. per member. Replies had been received from the Queensland, New South Wales and South Australian Branches, agreeing to the payment of 10s. It was explained that the Western Australian Branch had increased its subscription in order to meet its share of the expenses of the Federal National Health Insurance Committee. Dr. Crowther said that the members of the Tasmanian Branch had been heavily taxed for the current year by the obligation of each member to pay a contribution to the expenses of the Federal National Health Insurance Committee. He did not think that his Branch would agree to ask more from its members during the current year, but added that on behalf of the Branch he would agree to the principle of payment of the extra amount. It was finally agreed that the word "minimum" in the Federal Council's previous resolution should be changed to "maximum".

Further consideration was given to the grant of £1,000 *per annum* which had been received for three years from the Parent Body. During the discussion the view was expressed by several members of the Federal Council that the grant was in the nature of a rebate on account of the *per capita* payment made to the Parent Body each year by the Branches. It was resolved that the present state of finance of the Federal Council should be explained to the Council of the Association in England.

#### The Medical Association of South Africa (British Medical Association).

A letter was received from the Medical Association of South Africa (British Medical Association), asking for particulars of post-graduate lectures given in Australia by visitors from overseas. It was hoped that visitors to Australia might be induced to visit South Africa on their return journey to England. The Secretary reported that he had communicated with the post-graduate committees in New South Wales and Victoria with a view to obtaining the desired information. The Secretary's action was approved.

### The Writing of Prescriptions.

At the previous meeting of the Federal Council a letter was read which had been written to the Victorian Branch by a pharmacist in regard to the writing of prescriptions. The pharmacist drew attention to recent accidents that had happened, and inquired whether it would not be possible to alter the symbols at present in use for drachm and ounce respectively. The Federal Council had decided to ascertain the views of the Pharmaceutical Association of Australia. The Secretary reported that the Pharmaceutical Association had replied that at a meeting of the Association held at Canberra, at which the matter was discussed, it was decided not to recommend any action in the direction of endeavouring to abolish the use of prescription symbols at present in use. A report on the matter by Dr. Byron Stanton was forwarded by the Pharmaceutical Association to the Federal Council. In his report Dr. Stanton stated that he thought the real remedy lay in: (a) a more rigorous checking of every dose, and double checking if necessary; (b) an absolute refusal to dispense an excess dose unless the prescriber indicated his own recognition and responsibility by underlining and initialling it; (c) a greater willingness to communicate with the prescriber if the slightest doubt existed. An additional safety factor, Dr. Stanton added, would be the devotion of a more reasonable time to the study of *materia medica*. The Council decided to take no action.

### Pensions for Sufferers from Early Tuberculosis.

A letter was received from the South Australian Branch asking the Federal Council to approach the Federal Government in order to seek adequate pensions for early sufferers from tuberculosis. Before taking any action the Federal Council decided to ascertain what was being done in the various States for sufferers from tuberculosis.

### Medical Officers in the Royal Australian Navy.

A letter was received from the Navy Office regarding a vacancy for the position of Surgeon-Lieutenant for short service in the Royal Australian Navy, and suggesting that the Federal Council might take steps to notify medical practitioners of such vacancy. It was decided to draw the attention of the navy authorities to previous communications and to point out to them that while the short service scheme might render conditions of service more attractive to medical practitioners who wished to join for three to five years, the Federal Council was still of the opinion that the terms of service generally would not offer any inducement to medical practitioners to join the Royal Australian Navy as permanent officers.

### The Koch Method of Cancer Treatment.

The Western Australian Branch wrote regarding the Koch method of cancer treatment, and stating that six patients had been treated by these means without beneficial result. Dr. L. Hayward thought that patients treated by this method should be followed up. He said that he would like to see an investigation carried out in New South Wales. Dr. George Bell said that such an investigation was not a matter for the British Medical Association, but for the Commonwealth Health Department. He recalled the steps taken some years previously by the late Sir Neville Howse as Commonwealth Minister for Health, when he had certain beds set aside in a metropolitan hospital in Sydney to investigate an alleged cure for tuberculosis. Several other members of the Council thought that some investigation should be made. The Secretary referred to a statement of the Commonwealth Director-General of Health that there was no evidence of the value of the so-called cure; and it was also pointed out that many years previously it had been pronounced worthless by authorities in the United States of America, and that a report to that effect had been published in *The Journal of the American Medical Association*. It was resolved that the Commonwealth Department of Health should be approached in the matter.

### Australasian Medical Congress (British Medical Association), Sixth Session.

The Secretary reported that the date of the sixth session had not been finally decided, but that in all probability it would be held from September 2 to September 7, 1940. The executive committee submitted to the Federal Council the following names for appointment to the several offices:

**Patron:** His Royal Highness the Duke of Kent.

**Vice-Patron:** The Lieutenant-Governor of Western Australia, Sir James Mitchell.

**Vice-Presidents:** Dr. F. Antill Pockley, President of the Australasian Medical Congress (Ninth Session), 1911, Sydney; Dr. A. C. Purchas, President of the Australasian Medical Congress (Tenth Session), 1914, Auckland; Sir Louis Barnett, President of the Australasian Medical Congress (British Medical Association), Second Session, 1927, Dunedin; Dr. D. H. E. Lines, President, Australasian Medical Congress (British Medical Association), Fourth Session, 1934, Hobart; Sir James W. Barrett, Past President of the British Medical Association; Dr. G. H. Abbott, President of the Australasian Medical Congress (British Medical Association), Third Session, 1929, Sydney; Sir Henry Newland, President of the Australasian Medical Congress (British Medical Association), Fifth Session, 1937, Adelaide; Dr. R. H. Fetherston, Vice-President of the British Medical Association; Dr. H. E. Gibbs, Vice-President of the British Medical Association; Surgeon-Captain W. J. Carr, R.A.N., Director of the Naval Medical Services of Australia; Major-General R. M. Downes, Director-General of Medical Services of Australia; Dr. J. H. L. Cumpston, Director-General of Health, Commonwealth Department of Health; Colonel F. F. Bowerbank, Director of Medical Services, New Zealand; Dr. M. H. Watt, Director-General of Health, Dominion of New Zealand.

These nominations were approved by the Federal Council. It was noted that at a later date the Federal Council would receive nominations for appointment as Vice-President of one representative from each of the Australian Branches and from the New Zealand Branch.

In view of the fact that only one patron and one vice-patron were being appointed, the executive committee recommended that the following should be appointed honorary members of congress: the Chief Justice of Western Australia, the Premier of Western Australia, the Chancellor and the Vice-Chancellor of the University of Western Australia. This suggestion was approved.

Attention was drawn to the fact that the executive committee of congress had already appointed presidents of sections without having received recommendations from Branch councils in accordance with the rules of congress. It was resolved that the attention of the executive committee should be drawn to this rule so that it might be observed in regard to future appointments.

A letter was received from the executive committee of the sixth session embodying the suggestion that opportunity should be taken while visitors were present in Perth to throw open to the general public certain lectures delivered during the session. It was thought that school teachers and others from the country might be visiting Perth and that certain addresses given in popular form would be useful to them, particularly on account of the more isolated position of Western Australia. In the discussion it was agreed that members of the general public could not be admitted to any of the sectional meetings or be permitted to hear the addresses of presidents of sections. It was usual for one public lecture to be delivered at night during each session of congress; but as it was the intention of the executive committee to confine sectional meetings as far as possible to the mornings, the Federal Council agreed that popular lectures open to the public might be given during the afternoon in addition to the public lecture at night.

The executive committee of the sixth session suggested that for 1940 the post-graduate committees in the several States should refrain from holding their annual revision courses, since it was thought that medical practitioners would not care to leave their practices twice in one year.



It was resolved that the suggestion should be conveyed to the post-graduate committees for their consideration.

At the invitation of the President, the Editor of THE MEDICAL JOURNAL OF AUSTRALIA gave an account of some proposed arrangements in connexion with the sixth session of congress. He had had discussions with the executive committee and had been asked to find a prominent physician in England who would be willing to undertake the journey to Australia in order to address the plenary session of congress on the subject of rheumatism. An eminent physician willing to undertake the trip had been found; he was an authority on the subject and would attract a large audience. The practitioner had suggested that a branch of the Empire Rheumatism Council should be formed in Australia, and it was largely with the object of forming such a body that he was agreeable to undertake the journey. A discussion then ensued on the advisability of forming a branch of the Empire Rheumatism Council in Australia. After several members of the Federal Council had agreed that the formation of such a body would be useful, it was pointed out that the Empire Rheumatism Council was not a body composed entirely of medical practitioners, and that therefore the Federal Council could not undertake the formation of a branch in the Commonwealth. After further discussion it was resolved that a special group should be formed within the Association in Australia, having as its object the study of rheumatism. It was thought that this special group could then proceed to the formation of a branch of the Empire Rheumatism Council.

#### Medical Officers' Relief Fund (Federal).

The interim report of the trustees of the Medical Officers' Relief Fund (Federal) for the six months ended December 31, 1938, was received.

#### Organization of the British Medical Association in Australia.

The Secretary reported that he had written to the several Branches in connexion with the proposal that complete autonomy should be given to the Federal Council and to the Australian Branches by the Parent Body. Some of the Branches had not replied. In view of the fact that complete autonomy could not be granted until each of the Branches had become a corporate body, and as incorporation had not been carried out in all the States, further consideration of the matter was necessarily deferred.

#### British Medical Association Scholarships and Grants.

The Secretary reported that he had received communications from two medical practitioners who wished to have particulars regarding scholarships and grants. No replies had been received to further letters sent to these members, and any applications for scholarships or grants for the current year would therefore be too late.

#### Annual Meeting at Aberdeen.

Dr. L. E. Le Souef was appointed as representative of the Federal Council to attend the annual meeting of the Association at Aberdeen on July 21 to 23, 1939.

#### Representation of the Australian Branches at Meetings of the Representative Body.

A letter was received from the Editor of THE MEDICAL JOURNAL OF AUSTRALIA reporting a conversation with Professor R. J. A. Berry at the annual meeting of the Association at Plymouth in 1938. Professor Berry had pointed out that all six Australian Branches were not always represented at meetings of the Representative Body. He said that he thought that the Australian Branches should have adequate representation at these meetings, and he would be willing to act as representative for any Australian Branch that was not able to send a representative to England. A letter was also received from Professor Berry and Dr. Isaac Jones, dealing with the same matter. It was resolved that the correspondence should be forwarded to the Branches for action.

#### Proposed Formation of a Sub-Group on Rheumatism and Physical Medicine.

A request was received from Dr. F. May, of Melbourne, and seven colleagues, asking that the Federal Council should convene a meeting for the formation of an "Australian Association of Rheumatism and Physical Medicine" as a sub-group within the British Medical Association. It was decided that the matter should be referred to the Victorian Branch Council.

#### Ophthalmological Society of Australia.

A notice was received giving details of the annual meeting of the Ophthalmological Society of Australia (British Medical Association), which would be held in Melbourne from April 19 to 22, 1939.

#### Australasian Pharmaceutical Formulary.

Correspondence was read from the Pharmaceutical Society of Australia and New Zealand regarding the proposed revision of the hospital section of the Australasian Pharmaceutical Formulary. A report was also received on the same subject from Dr. F. W. Carter and Dr. F. L. Davies. In discussing the matter, Dr. Carter said that the formulary, though of use in general practice, was bad for practitioners as far as their knowledge of *materia medica* was concerned. He was also insistent that the Australasian Pharmaceutical Formulary should not be allowed to be the only form of pharmacopoeia for use under any scheme of national health insurance. With this view the members of the Federal Council concurred. It was resolved that it would be inadvisable to issue a new edition of the Australasian Pharmaceutical Formulary before the appearance of the next issue of the British Pharmacopoeia in 1940.

#### Terms and Conditions of Service in Public Medical Services.

At a previous meeting of the Federal Council Dr. F. L. Davies and Dr. J. Newman Morris had been appointed a special subcommittee to report on the terms and conditions of appointment of medical practitioners employed in public medical services. It was thought at that time that if possible some standard should be adopted to obviate the divergence in the salaries offered for whole-time services of medical officers. The Secretary stated that he had sent the report of the subcommittee to the several Branch councils for comment. The New South Wales Branch had not approved of the amounts set out in the report and had given detailed reasons in support of its objection. Some of the other Branches also expressed disagreement, and the Victorian Branch had not considered the matter. It was resolved that the report should be redrafted.

#### Physical Fitness.

The Secretary made further reference to the pronouncement of the National Health and Medical Research Council on the subject of physical fitness. This pronouncement was published in full in the issue of February 4, 1939, at page 204. The report had been forwarded to the Branches with a covering letter, in which it was stated that it was hoped that each Branch would participate as far as possible in the promotion of physical fitness and that individual members of the Association in Australia would take an active interest. So far no replies had been received from the Branches.

#### The Prevention of Blindness.

Further reference was made to the reports on the prevention of blindness and to the proposed application for a grant from the National Health and Medical Research Council for the carrying out of surveys of the blind in the larger Australian States. A supplementary report was also received from Dr. J. Bruce Hamilton and Dr. W. B. Counsell, of Hobart. This report was published in THE MEDICAL JOURNAL OF AUSTRALIA of March 18, 1939.



### A Complete Medical Service for Australia.

A reference was made to the proposal of the Queensland Branch that a complete medical service should be planned for Australia. Dr. T. A. Price expressed the opinion of his Branch that a complete scheme should be elaborated and put before the general public in pamphlet form as an ideal to be sought. It was thought that the promulgation of such a scheme would be useful. Dr. Price insisted that the public should know what was in the minds of members of the medical profession and what it thought was necessary for the safeguarding of the health of the nation. He thought that certain appendices should be drawn up in connexion with such a scheme. One appendix might deal with the importance of the separation of the medical benefit from the cash benefit. Other matters which might be considered were the estimated cost of the cash benefit and the prevention of overlapping by efficient organization, as well as the loss sustained by industry by failure of employees to seek early medical advice and the making of an estimate of the present cost of medical care.

At the suggestion of Dr. Bell it was resolved that a subcommittee should be appointed to formulate such a scheme and that the subcommittee should consist of Dr. T. A. Price, Dr. W. F. Simmonds and Dr. J. H. Gowland.

### National Health Insurance.

The Federal Council considered the several resolutions adopted by the Federal National Health Insurance Committee at its meeting on the previous day. These resolutions were to serve as a basis for discussion with representatives of the Government. After discussion the resolutions were adopted. It is the intention of the Federal Council to issue at an early date a statement dealing with the whole question.

### Medical Practitioners' Emergency Fund.

Dr. W. F. Simmonds raised the question of the establishment of a Federal Medical Practitioners' Emergency Fund. He drew attention to the fund established by the New South Wales Branch some years previously and expressed the opinion that the Federal Council should have at its disposal a fund on which it could draw in order to come to the assistance of Branches or of persons affected by government legislation or other agency. In his opinion the Branches should raise their subscription by two guineas *per annum* until such time as a substantial amount had been collected. After the discussion further consideration of the matter was deferred.

### Date and Place of Next Meeting.

Determination of the date and place of the next meeting was left in the hands of the President.

### Votes of Thanks.

A vote of thanks was accorded to the Council of the Victorian Branch of the British Medical Association for having provided accommodation for the meeting and for its hospitality.

A vote of thanks was also accorded to Sir Henry Newland for having presided.

### SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held at the Renwick Hospital for Infants, Summer Hill, on November 17, 1938. The meeting took the form of a series of clinical demonstrations by members of the honorary staff. Part of the report of this meeting appeared in the issue of April 1, 1939.

### Icterus Gravis.

DR. L. B. DIAMOND showed a female child which had first been seen when it was eight days old. It was the

second child of its mother; the first baby had died seven hours after birth. The patient's birth had been normal; but it suffered from *asphyxia lida*, was jaundiced from birth, and had an enlarged liver. There was no family history of syphilis.

On the child's admission to hospital on March 11, 1938, its temperature was normal and its pulse rate was 152 in the minute. Its general condition was good, but it was very jaundiced; the edge of the liver was palpable two inches below the costal margin; the conjunctivae were jaundiced. The umbilicus was healed and there was no sign of umbilical sepsis. The child was given 70 cubic centimetres of the father's blood, citrated, on March 12, 1938; the blood count then revealed a grave anaemia. On March 15, 1938, the erythrocytes numbered 1,960,000 per cubic millimetre, the haemoglobin value was 68%, and the colour index was 1.7; the leucocytes numbered 8,900 per cubic millimetre. It was found impossible to repeat the blood transfusion, as the father's blood and that of several relatives now proved to be incompatible. Two intramuscular injections of mother's blood were given on March 25 and 31. The child's condition gradually improved, and on April 22, 1938, the erythrocytes numbered 4,000,000 per cubic millimetre, the haemoglobin value was 74%, and the colour index was 0.9. The erythrocytes were normal in size and shape; slight jaundice was still present, but the child was otherwise well and was gaining in weight. The liver was still palpable, but was much smaller than formerly. When the child was discharged from hospital its blood was within average normal limits and its colour was good.

### Cretinism.

DR. INGLIS ROBERTSON showed a child which was suffering from cretinism. The baby had been under treatment for some weeks and so did not present the typical picture which she had presented when first she came for treatment. There were still sufficient signs remaining, however, to make a diagnosis possible. There was still some confusion with regard to the diagnosis of cretins from mongols. Cretinism was rare in Australia, but mongolism was very much more common. The cretin was a lethargic child with a very bad colour, one whose skin seemed to be too big for it and hung in folds. There was constipation and almost always an umbilical hernia was present. Some of these herniae were very large, but they all seemed to get better without any surgical treatment as the cretinism was treated. The head of the cretin was long from before backward, and there was a frown on the forehead. The hair was dry and scanty. The mongol, on the other hand, was a lively little person, whose head was round; there was a smooth skin of good colour, and there was not the same tendency to umbilical hernia. The hair was fine and well nourished. Many of these mongols had congenital abnormalities of the heart. The one symptom in common was that both mongols and cretins lolled their tongues. The prognosis for the cretin was good if the condition was recognized early, and some of them grew up to be perfectly normal children, provided the supply of thyreoid extract was kept up. If the condition was not recognized until after puberty they never seemed to do much good, and Dr. Robertson thought that it was better to leave them alone.

### Dermatological Conditions.

DR. J. C. BELISARIO showed eight patients suffering from infantile eczema; their ages ranged from nineteen days to one year and ten months; he also showed two patients suffering from *Nichen urticatus*.

Of the eight patients with infantile eczema, one had an erythematopapular finely scaling dermatitis with a shiny appearance. The dermatitis had commenced in the napkin area and spread to the legs, lower part of the trunk, neck and ears. This condition was an organismal dermatitis, having been initiated by the irritant action of urine-soaked napkins. The irritating effect of ammonia *plus* moisture lowered the vitality of the neighbouring skin, thus allowing normal saprophytic skin organisms to become pathogenic. This process was followed by an auto-

sensitisation eruption spreading to other parts of the body owing to the skin's becoming sensitized to the irritating effects of ammonia and the organisms as well. The reason for making this diagnosis was that plain soothing lotions or creams failed to ameliorate the condition, whereas weak antiseptics combined with weak concentrations of tar, or alone, produced immediate improvement on all areas. Combined with this routine, the soiled napkins were washed with soap and hot water, then boiled in plain water and soaked in a weak antiseptic solution before being dried for use.

Another patient had had an erythematopapular dermatitis which had started on the face several months previously and spread to the arms and body. Only the face was still affected at the time the patient was shown. The perioral area and scalp were unaffected from the start. This condition was a *neurodermatitis disseminata* or atopic dermatitis, as there was a history of a similar condition in the mother. Attention was drawn to the fact that the inherent susceptibility to sensitization of the epidermal cells and a probable sensitivity of the nerve endings were the essential features of the disease and the dermatitis was produced by friction. Diet also might have played a part in aggravating this condition. The most common articles of diet which caused this aggravation were egg white, milk and wheat flour. Treatment consisted in the use of a weak tar cream and an oily cleansing lotion, immobilisation of the limbs, and the administration of a quarter of a grain of "Luminal" at night in the early stages. Small intramuscular injections of pituitrin were also employed with benefit.

Four patients were shown as furnishing examples of *neurodermatitis disseminata*, which were complicated by a superimposed organismal element, as evidenced by the fact that the addition of 1% of ammoniated mercury to a tar cream was necessary to improve the condition. In these cases elimination diets were of no avail, but pituitrin given intramuscularly and in one case injections of the mother's serum proved of great benefit.

Another patient was a baby nineteen days old. The patient had developed jaundice several days after birth, but only a slight discoloration of the conjunctivae was left. The patient had been entirely breast fed, and no exceptional change had been made in the mother's diet. The mother also stated that the baby showed no inclination to rub or scratch itself. Erythematopapules were present on the face, arms, hands and legs. The perioral area was unaffected. This condition was an allergic dermatitis due to some disturbance of the internal metabolism, which was the primary feature. On the other hand, in the *neurodermatitis disseminata* type of case, the susceptibility to irritation of the nerve endings and the epidermal cells was the primary feature, the dermatitis being produced by friction. In cases of allergic dermatitis, when susceptibility to irritation of the nerve endings was not the primary feature, the administration of *Hydrargyrum cum Creta* by mouth was usually of benefit.

Another patient had had a dermatitis all over the body, head and limbs for several months. The dermatitis had commenced on the scalp and was aggravated by some external application. At one stage a generalised erythrodermia was present, but this had considerably faded. There was still an erythematous-squamous greasy dermatitis, most severe in the scalp. This condition was a combination of seborrhoeic dermatitis and *dermatitis medicamentosa*. The treatment in the early stages was with a calomine liniment and lanoline cream, and later a weak ichthyol paste was employed.

Important points mentioned in connexion with infantile eczema were the following:

1. The term infantile eczema was a misleading one, because the typical clinical features of eczema, namely, pin-head sized vesicles, wells and crusts, were not often seen. Consequently as a general term infantile dermatitis, although leaving much to be desired, would be more appropriate.

2. Infantile eczema was not a separate entity, as all the clinical appearances encountered in infants were also seen in adults.

3. Infantile eczema could be divided into four main headings: (a) seborrhoeic dermatitis, (b) organismal dermatitis (c) *dermatitis medicamentosa*, (d) allergic dermatitis, of which *neurodermatitis disseminata* was the most common variety. Any one of these or a combination of two or more types might be present in an individual.

4. In the treatment of generalized cases, when creams or ointments were being used, the patient should be entirely cleansed of the medicament for a period of two hours every day, in order to permit the normal skin excretion of sweat and metabolic products to be eliminated in this way. Otherwise the general health was interfered with in a manner not seen in the adult, and an occasional patient would become seriously ill and sometimes die.

5. Diet might play a part in the production or aggravation of an existing condition, but not so large a part as was originally believed in some types. In the first year diet played a more prominent part than from the first year onward, when external allergens, organisms, external irritants *et cetera* came more and more into evidence as causal factors.

6. Even when an article of diet could be incriminated, its omission was often followed by no benefit because the patient developed a polyvalent sensitivity. This might also apply to external allergens.

7. Sunlight baths were of considerable benefit in the majority of cases.

The two patients with *Hæken articatus* were shown to illustrate the beneficial effects of intramuscular injections of pituitrin twice a week. In one case the condition had completely cleared up, and in the other had almost cleared up after two weeks' treatment. Both patients had had the condition before treatment for several months. No alteration in the diet had been made during treatment. One of the patients was admitted to hospital because the parents lived out of town, and the other was treated as an out-patient.

## Correspondence.

### INSURANCE PRACTICE IN ENGLAND.

Sir: My attention has been called to a letter from Dr. Sydney Pern which was published, under the heading "National Health Insurance", in your issue of January 19. While I have no wish to intervene in the present controversy regarding health insurance in Australia, it would be unfortunate if at this juncture a false impression were to be given of the conditions which prevail here at home.

I cannot, of course, challenge the accuracy with which Dr. Pern reproduces certain opinions which were expressed to him while he was in this country. I cannot, because I have never met those opinions myself. I can and must challenge his facts and his interpretation of facts.

I have it on very good authority that 33% of the medical men are mortgaged and are too poor to afford an annual holiday.

I must confess that Dr. Pern has the advantage of me in that I know of no such statistics. His general suggestion is, however, fantastic, unless he is thinking of the procedure—which is common enough among recently qualified practitioners—of obtaining a loan, generally secured on a life insurance policy, with which to meet the initial expense of embarking on practice. Similarly, like other members of the community, he may make use of a mortgage when purchasing his house. Such loans, however, partake rather of the nature of an investment than of indebtedness in the ordinary sense. Indeed, if the existence of a debenture issue were accepted in industry as a sign of insolvency, there would be comparatively few large businesses which would pass Dr. Pern's test of even moderate prosperity. At any rate there is no evidence which would suggest that medical practitioners are not in general well able to meet their



obligations. While if the terms on which such advances are available are taken as a guide, then the credit of the individual practitioner has never stood so high.

The difficulty which is invariably experienced in finding a *locum tenens* during the month of August provides a sufficient answer to Dr. Pern's suggestion regarding holidays.

All cases which are of the slightest bother are sent off to hospitals.

The English practitioner no doubt makes more use of hospital facilities on the average than does his colleague in Australia, for the reason that such facilities are on the average more widely available, and particularly in the more dense centres of population tend to be more highly specialized. The business of the general practitioner is to do his best for his patient in the particular circumstances of each case, and I would not agree that there was any slackening in his sense of responsibility. Moreover, he still deserves, and I hope will continue to deserve, his title of general practitioner.

They do not even set their own fractures.

They can and do, if necessary. All the evidence, however, suggests that many times better results are obtained by a properly organized fracture unit than can be obtained either by a hospital operating without such a unit or by the general practitioner. The British Medical Association has lately pressed the Government to establish such centres on a national scale. It is estimated that the average period of incapacity in industrial accidents could be reduced in this way by about two-thirds, with a corresponding saving in compensation payments.

There are certain dispensing formulæ which are used for the majority of illnesses, and if more expensive drugs are used the prescribers are liable to be rapped over the knuckles.

The national health insurance practitioner is required, under his terms of service, to prescribe whatever drugs he may consider necessary on medical grounds. A case was lately reported in which a single patient had cost the service £308 in the course of a year. Heavy prescribing costs can only be penalized if they can be shown to be unnecessary, and the practitioner's judges in the event of complaint are his own professional colleagues in the first instance.

The majority either "fake" their returns or simply refuse to enter them.

Official forms are a necessary element in any system of insurance service. Some practitioners keep their records conscientiously and regularly. Others may be more casual in their methods, at least where relatively minor items of service are concerned. Records are, however, subject to regular inspection, and there is no evidence of any widespread complaint. As a general statement, therefore, Dr. Pern's suggestion is both misleading and incorrect.

Many show so little interest in modern advancements that a medical journal is not opened from one year's end to the other.

The interest taken by national insurance practitioners in "modern advancements" is conclusively shown by their enthusiastic reception of a scheme which has recently been introduced, whereby "refresher courses" are made available to any such practitioners who have been qualified for more than five years. Last year was the first complete year in which this scheme was operative. More than 1,100 insurance practitioners attended courses, and three times as many applications were received as there were vacancies. This year some 1,500 practitioners will similarly benefit, and it is already clear that the demand will be substantially greater than the supply. The courses provided last a fortnight and grants are available to cover the fee for the course, travelling expenses, subsistence allowance, and the engagement of a *locum* where necessary. The cost is defrayed out of the national health insurance funds.

A large number have ceased to be members of the British Medical Association . . .

Membership of the Association continues to increase at a steady rate of 800 to 1,000 per year. More than half of this increase comes usually, and did last year, from the home country. There has been no outburst of resignations such as is suggested.

With Dr. Pern's last statement I can cordially agree: "It is for us to use every possible effort to see that our profession is adequately rewarded." I would only add that satisfactory conditions of service are of scarcely less importance.

Yours, etc.,

G. C. ANDERSON,  
Secretary.

British Medical Association House,  
Tavistock Square,  
London, W.C.1.  
March 18, 1939.

#### THE BALKAN MEDICAL UNION.

SIR: I am sending you enclosed the manifest which has been voted by the doctor members of the Balkan Medical Union at their meeting for the fifth Medical Week at Istanbul. I ask you earnestly to publish it in your paper.

The same manifest is addressed to the medical journals of the whole world with the aim of rousing if possible a favourable public opinion for adopting the necessary measures against the dangers to which the civil population will be exposed during a "total war".

With the assurance that this proposition will be warmly received yourself.

Yours, etc.,

The President of the Balkan Medical Union,  
PROF. DR. ÂKIL MOUKHTAR ÜZDEN.

The Balkan Medical Union is essentially a scientific organization. But it is also represents an ideal. Its aim is to bring together the intellectuals of different countries so that they may know each other and come to a mutual respect and understanding, and in this way form a compact block capable of opposing the misunderstanding that engenders hate and disastrous struggles between nations.

This "Union" was formed in 1931 by a handful of men sincerely convinced that this humanitarian aim could and should be easily attained. Their conviction is based on the belief that this object is in the line of human evolution and that in helping this evolution the forward march can be hastened.

For intellectuals who have known how to see and grasp that which is the essence of humanity what more beautiful ideal can be thought of than to work with all their faculties, all their energy, to establish an understanding between men.

It is through the "Medical Weeks" that our Balkan Union tends to realize these aspirations.

Athens, Belgrade, Bucharest and Istanbul each in turn have seen more and more numerous and enthusiastic groups come together, all permeated by the same desire of comprehension and friendship. We doctors know that a very small quantity of vaccine can protect millions of men from the danger of contagious diseases. So the good seed scattered by the Balkan Medical Union is a real remedy against the evils set loose by human passion.

PROF. DR. ÂKIL MOUKHTAR ÜZDEN.

The Balkan Medical Union, in session at Istanbul, for the fifth Medical Week, having taken into consideration the terrible sufferings which a total war will bring upon the civil population of open towns, together with the total lack of any adequate means of protection, and having discovered that even in its restricted form the project of "sanitary towns" has not yet been adopted, and that all efforts made to protect civilians against chemical warfare have till now remained as proposals only, and that even the protocol prohibiting the use of asphyxiating gas has not yet been ratified by all nations, has therefore decided to address itself to doctors of every nation with an appeal



to take active measures and to fulfil this professional and humanitarian duty of awakening and stirring public opinion.

The Balkan Medical Union believes that only enlightened international opinion can make plain the imminence of the danger and the proved uselessness, even for the victor, of these terrible atrocities, and can thus lead to effective action.

The immutable truth that hate breeds only hate, and atrocity breeds vengeance must be impressed on everyone.

PROF. DR. BENIS, DR. SCARAMANGA  
(Athens), DR. ZIKA MARKOVIC, PROF.  
DR. K. SAHOVIC, DR. M. SIMOVIC  
(Belgrade), PROF. DR. GHIDORGHU,  
DR. POPESCU BUREU (Bucharest),  
PROF. DR. AKIL MUHTAR OZEN,  
PROF. SEDAT TAVAT, PROF. DR. A.  
SÜHEYL ÜNVER (Istanbul).

## Medical Prizes.

### THE WILLIAM GIBSON RESEARCH SCHOLARSHIP FOR MEDICAL WOMEN.

MISS MAUD MARGARET GIBSON has placed in the hands of the Royal Society of Medicine a sum of money sufficient to provide a scholarship of the yearly value of £292, in memory of her father, the late Mr. William Gibson, of Melbourne, Australia. The scholarship is awarded from time to time by the society to qualified medical women who are subjects of the British Empire, and is tenable for a period of two years, but may in special circumstances be extended to a third year. The next award will be made in June, 1939.

In choosing a scholar the society will be guided in its choice "either by research work already done by her or by research work which she contemplates. The scholar shall be free to travel at her own will for the purpose of the research she has undertaken."

There is no competitive examination, nor need a thesis or other work for publication or otherwise be submitted. The society has power at any time to terminate the grant if it has reason to be dissatisfied with the work or conduct of the scholar.

Applications should be accompanied by a statement of professional training, degrees or diplomas, and of appointments, together with a schedule of the proposed research. Applications must be accompanied by testimonials, one as to academical or professional status and one as to general character. Envelopes containing applications of *cetera*, should be marked on top left-hand corner "William Gibson Research Scholarship" and should be addressed to Mr. G. R. Edwards, Secretary, Royal Society of Medicine, 1, Wimpole Street, London, W.1, and be received not later than Thursday, June 1, 1939.

### THE STAWELL MEMORIAL CLINICAL PRIZE.

THE Stawell Memorial Clinical Prize, which consists of a money award of £50, is open for competition.

The purpose of the fund from which the prize is given is to commemorate appropriately the memory of the late President-Elect of the 103rd annual meeting of the British Medical Association (Sir Richard Stawell) and his great influence in the clinical teaching of medical students and young graduates. Donations to establish the fund were received from members of the medical profession and others, to which was added a grant by the executive of the 103rd annual meeting.

The following are the conditions governing the award:

1. The memorial shall take the form of an essay, and competition shall be open to Australian graduates of not more than three years' standing on December 31, 1938.

2. The subject of the essay upon which the prize shall be awarded is "Sclerosis of the Coronary Arteries". The subject is to be dealt with from the clinical and pathological aspects. The phenomena arising from acute occlusion should not be included.

3. The work submitted must be based on personal observations and experiences collected by the candidate in medical practice, and a high order of excellence is required.

4. The trustees reserve the right, if no essay is entered of sufficient merit, to withhold the award.

5. Essays must be in the hands of the trustees, care of the Medical Secretary, British Medical Association (Victorian Branch), 426, Albert Street, East Melbourne, C.2, not later than December 31, 1939.

6. The prize shall be presented at a meeting of the Royal Australasian College of Physicians in Melbourne.

7. No study or essay that has been published in the medical Press or elsewhere will be considered eligible for the prize.

8. If any question arises in reference to the eligibility of the candidate or the admissibility of his or her essay, the decision of the trustees on any such point shall be final.

9. Each essay must be typewritten or printed, must be distinguished by a motto, and must be accompanied by a sealed envelope marked with the same motto, in which envelope must be enclosed the candidate's name and address.

10. The trustees reserve the right to publish the essay, for which the prize is awarded, in THE MEDICAL JOURNAL OF AUSTRALIA.

11. Further inquiries relative to the prize should be addressed to the Medical Secretary, British Medical Association (Victorian Branch), 426, Albert Street, East Melbourne, C.2.

## Obituary.

### JAMES SCOTT PATON.

DR. J. MACBAIN ROSS writes as follows of the late Dr. James Scott Paton:

The death occurred on February 25, 1939, of James Scott Paton, M.R.C.S. et L.R.C.P., at East Malvern, a suburb of Melbourne.

He was a son of Dr. Paton, the celebrated missionary to the New Hebrides. He was educated at Scotch College, Melbourne, but did his medical work at Saint Mary's Hospital, London. He was a clever and painstaking student and thought highly of by the teachers to the hospital, among whom were Dr. David Lees and Sir William Wilcocks. From the hospital he went out to South Africa as civil surgeon in the Boer War, and received a medal and three clasps. Returning to England he obtained a post at the General Hospital in Saint Bartholomew's, a town near London. He remained several years in that district, eventually marrying the daughter of one of the medical men practising there. His health not being good, he returned to Australia and had practices near Newcastle, at Lismore in Victoria, and finally purchased the practice of Dr. R. W. Chambers in Carlton. He was a great success in private practice, beloved by his patients, and he is sadly missed by his friends, and especially by his wife, his daughter and his three sons.

### EDITH HELEN BARRETT.

THE following tribute to the memory of the late Dr. Edith Helen Barrett has been received.

The death of Dr. Edith Helen Barrett has removed one of the pioneers of women in medicine in Melbourne, and one who helped to pave the way for a younger generation. Having qualified with honours at the Melbourne University, she became a resident medical officer at the Melbourne Hospital.

On leaving the hospital she joined the practice of her father, the late Dr. James Barrett, a well-known medical practitioner in South Melbourne, and there she was very active in helping women and children as well as in the various institutions in the district.

From 1904 she was on the honorary medical staff of the Queen Victoria Hospital, at first as honorary medical officer to out-patients, later becoming honorary surgeon to in-patients, a position which she held until her retirement due to ill health.

During the whole of her professional career Dr. Edith Barrett was keenly interested in various social organizations, helping them by her constant work and advice. She was honorary secretary to the National Council of Women for many years, helping to direct its policy and activities.

In association with Sir James Barrett she did much to develop the bush nursing scheme, and frequently visited country centres.

During the whole period of the War she acted as honorary secretary to the Red Cross Association. This unselfish devotion was later recognized by the conferring upon her the honour of C.B.E.

For the last few years of her life ill health compelled her to retire from her many and varied activities.

"J.L.G."

#### PERCY MOORE WOOD.

Dr. E. H. M. STEPHEN writes of Dr. Percy Moore Wood, whose death was recently announced in these pages.

On completing a distinguished career as a student and resident medical officer at Guy's Hospital, considerations of health led Dr. Moore Wood to spend some time at sea on a "cable ship". After this he practised at Darwin for a period, during which he saw sufficient of the "never-never" country to cause him to retain an enduring interest in, and affection for, this region. He then practised in Ashfield up till two years ago.

He was dignified, courteous and reserved, and earned the lasting respect and affection of the patients for whom he laboured both day and night. The practice of his profession was his absorbing interest, and no consideration of fatigue or ill health would prevent him from responding to any call for his assistance. He considered the sick person in a humpy likely to need his personal care more than those more fortunately placed, and would lose a night's rest willingly to travel in rain and mud to treat some dweller in "Tintown" whom he knew to be a constant offender in night calls. The study of the progress of medicine fascinated him, and he was a generous supporter of any movement that made for the welfare and advantage of the profession.

He gave lavishly to relieve distress, and his patients received an affectionate and indulgent attention in their time of anxiety and suffering.

He faced illness and the advent of old age with consistent courage, and had the satisfaction of seeing the suburb whose interests he had very near to his heart make prodigious strides in importance and prosperity.

His life of service was rewarded by a deep loyalty from the people for whom he did so much.

#### JAMES ELI WEBB.

We are indebted to Dr. W. F. Simmons for the following account of the career of Dr. James Eli Webb.

James Eli Webb was a second year boy at Sydney High School when I was initiated in January, 1902, and from then up to the present, except for the War years, our paths have run more or less parallel.

Webb was one of the bright lads of the school and did so well at the old Junior Examination that he obtained a matriculation pass which allowed him to enter the Faculty of Arts. At the university he did a good course and graduated with honours. He was one of the youngest students to obtain the degree of B.A. In 1908 he entered the Faculty of Medicine and graduated in 1913, M.B., Ch.M.

Along with some of his friends he accepted appointment as resident medical officer at the Perth General Hospital, Western Australia.

War broke out and Webb attempted to enlist but was rejected as medically unfit.

In 1918 he settled at Mortdale, New South Wales, which was then a very scattered settlement. His practice extended from Sans Souci to Menai and from Hurstville to Como. The roads were unmade and he was a true pioneer. The influenza epidemic made him a hero. He worked day and night for months, and it is felt that the toll this heavy work took of him greatly undermined his health. From 1920 onwards his practice increased greatly and he took in a partner and later on a second. These men eased the burden for him, and his ever-active brain found a new call for service. When he entered municipal life he topped the poll at his first attempt. He served Hurstville Council so well that after a couple of years he was elected mayor. He filled the position so successfully that when a general election occurred he was first choice for the United Australia Party. At his first attempt he was hopelessly defeated by the most popular Labour member in New South Wales. Webb was the first to congratulate his opponent. When the Lang Government was dismissed in 1932 he was again selected to contest this difficult seat, and this time he succeeded in defeating his former rival.

He gave splendid service to the district and was ever ready to help the needy and distressed. At the 1935 election he was again returned after another hard fight, but he had consolidated his position. In 1938 he won the seat with a very large majority, and although he informed his friends that this would be his last term in Parliament it was hoped that in the future he might be persuaded to change his mind.

Webb was not a bit like a politician. He never spoke for the sake of speaking. Often when he did so his conversation was of the provocative type, just because he wanted to get his friend's or opponent's point of view. When he spoke in Parliament it was always on a subject about which his professional knowledge or his training in the Faculty of Arts made him competent to speak, and he was listened to with the greatest respect. A politician on the opposite side of the House once said to me: "The little doctor is a true democrat; he is on the wrong side of the House."

In 1926 he married Miss Huxley, of Gulgong, who was matron of one of the local private hospitals. She very ably assisted her husband in his professional work, and her term as Mayoress of Hurstville and later as wife of the member of the district is remembered as a splendid example of mutual cooperation and self-sacrifice for the people of the municipality and district. Of this happy marriage there are a son aged twelve years and a daughter aged ten years.

If the tributes paid by the State Ministry and leaders of other political parties, the huge attendance at the funeral—the largest ever seen in St. George district—and the private tributes of grateful patients and needy citizens mean anything, then the life of James Eli Webb has not been lived in vain.

#### JAMES PATRICK KELLY.

We regret to announce the death of Dr. James Patrick Kelly, which occurred on April 16, 1939, at Bondi, New South Wales.

#### THE FACULTY OF RADIOLOGISTS.

THE British Association of Radiologists and the Society of Radiotherapists of Great Britain and Ireland have decided to amalgamate under the title of "The Faculty of Radiologists". The work of the faculty will be carried on at the old office of the British Association of Radiologists, at 32, Welbeck Street, London, W.1.



## Post-Graduate Work.

### LECTURES ON AIR RAID PRECAUTIONS AND GAS ATTACKS.

THE New South Wales Post-Graduate Committee in Medicine, in conjunction with the Director-General of Medical Services, has arranged for five lectures on air raid precautions and gas attacks to be given at the R. H. Todd Assembly Hall, 135, Macquarie Street, at 5 p.m. on each of the undermentioned dates:

Friday, April 28, and Tuesday, May 2: "The Weapons Used in Raids and their Effects", Major Gooch.

Thursday, May 4: "Physiological Effects of Gas and First Aid Treatment", Professor H. W. Davies.

Tuesday, May 9: "The Duty of a Medical Officer to Civil Population in Gas and High Explosive Attacks", Dr. A. W. Morrow.

All medical men are invited to attend, and admission is free.

## Nominations and Elections.

THE undermentioned has applied for election as a member of the Queensland Branch of the British Medical Association:

Baumatz, Isaia, M.D., 1925 (Zurich), M.D., 1936 (Sienna), Mental Hospital, Goodna.

The undermentioned have been elected members of the Queensland Branch of the British Medical Association:

McDonald, Hew Fancourt Graham, M.B., B.S., 1937 (Univ. Melbourne), Children's Hospital, Brisbane.  
Stephenson, Stuart Montserrat, M.B., B.S., 1936 (Univ. Sydney), Southport.

## Diary for the Month.

- APR. 26.—Victorian Branch, B.M.A.: Council.  
APR. 27.—New South Wales Branch, B.M.A.: Branch.  
APR. 27.—South Australian Branch, B.M.A.: Branch.  
APR. 28.—Queensland Branch, B.M.A.: Council.  
MAY 2.—New South Wales Branch, B.M.A.: Organization and Science Committee.  
MAY 3.—Victorian Branch, B.M.A.: Branch.  
MAY 3.—Western Australian Branch, B.M.A.: Council.  
MAY 4.—South Australian Branch, B.M.A.: Council.  
MAY 5.—Queensland Branch, B.M.A.: Branch.  
MAY 9.—New South Wales Branch, B.M.A.: Executive and Finance Committee.  
MAY 12.—Queensland Branch, B.M.A.: Council.  
MAY 16.—New South Wales Branch, B.M.A.: Ethics Committee.  
MAY 17.—Western Australian Branch, B.M.A.: Branch.  
MAY 18.—New South Wales Branch, B.M.A.: Clinical Meeting.

## Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser", pages xvi to xviii.

DEPARTMENT OF HEALTH, MELBOURNE, VICTORIA: Medical Officer.

McKINLAY HOSPITALS BOARD, JULIA CREEK, QUEENSLAND: Medical Officer.

NAREMBEEN ROAD BOARD, NAREMBEEN, WESTERN AUSTRALIA: Medical Officer.

REPATRIATION COMMISSION, MELBOURNE, VICTORIA: Visiting Specialist (Eye Diseases).

ST. GEORGE DISTRICT HOSPITAL, KOGARAH, NEW SOUTH WALES: Resident Medical Officers.

## Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCHES.	APPOINTMENTS.
	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmalm United Friendly Societies' Dispensary.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17.	Brisbane Associate Friendly Societies' Medical Institute. Proserpine District Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 178, North Terrace, Adelaide.	All Lodge appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 265, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.

## Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street Glebe, New South Wales. (Telephones: MW 2651-3.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognise any claim arising out of non-receipt of journals unless such a notification is received within one month.

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £3 for Australia and £2 5s. abroad per annum payable in advance.